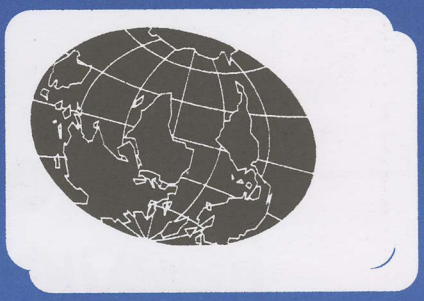
Bob Cooper's

AUGUST 15 2007

SatFACTS

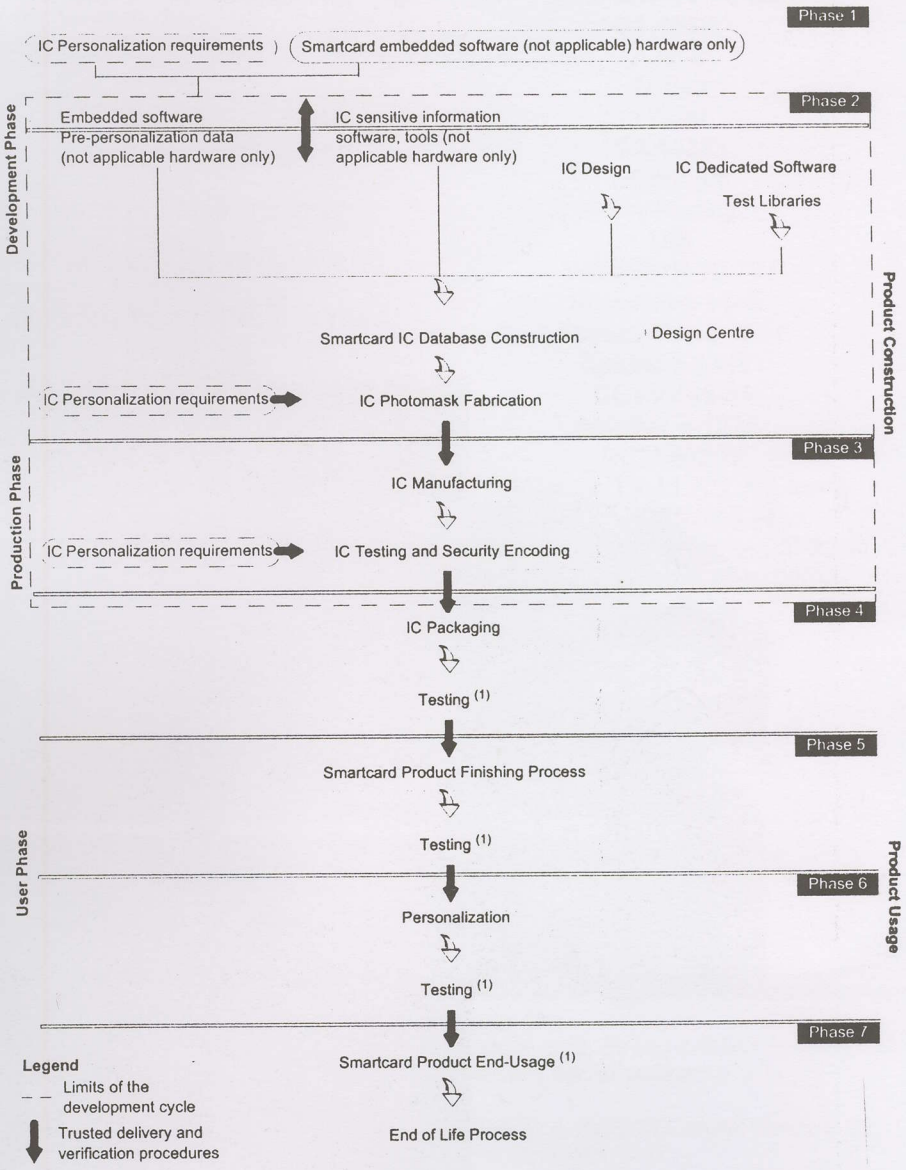
MONTHLY



Reporting on "The World" of satellite television in the Pacific and Asia

IN THIS ISSUE

Vol. 13 ◆ No. 156
Price Per Copy:
NZ$10/A$11/US$/Euro8



Atmel AT90SC7272C
The Goose Cooker

freeview

The first approved freeview receiver is here

Freeview™ certified

DVB compliant

Video: YPbPr & Composite outputs

Audio: RCA, SPDIK

Freeview™ 8-day programming guide

Regionalisation feature©

Max. 1000 channels

Widescreen capable

Enabled for Interactive TV

Easy installation and Setup

Front

Rear

ZINWELL

For more information on the ZMX-7500 receiver
email wsa@zinwellaustralia.com.au

SatFACTS MONTHLY

ISSN 1174-0779

is published 12 times each year (on or about the 15th of each month) by Far North Cablevision, Ltd. This publication is dedicated to the premise that as we enter the 21st century, ancient 20th century notions concerning borders and boundaries no longer define a person's horizon. In the air, all around you, are microwave signals carrying messages of entertainment, information and education. These messages are available to anyone willing to install appropriate receiving equipment and, where applicable, pay a monthly or annual fee to receive the content of these messages in the privacy of their own home. Welcome to the 21st century - a world without borders, a world without boundaries.

Editor/Publisher
Robert B. Cooper (ZL4AAA)
Office Manager
Gay V. Cooper (ZL1GG)

Reaching SatFACTS
Tel: 64-9-406-0651
Fax: 64-9-406-1083
Mail: PO Box 330
Mangonui, Far North
0442, New Zealand
Email -Skyking@clear.net.nz
http://www .apsattv.com
www.bobcooper.tv

Subscription Rates
Within NZ: $70 p/y
Australia: AV-COMM Pty Ltd.
PO Box 225, Brookvale,
N.S.W. 2100
61-2-9939-4377
Elsewhere: US$75p/y
All copies sent airmail post.

Finishing year thirteen!

Follow the money

As reported page 7 here, "the plague is back." A major supplier of smart card technology appears from European reports to have version 2 of their system breached; big time. Moreover, lest you discount this because "it is over there," think again. An Australian version began to appear on eBay as early as July 15.

My investigation convinces at least me this is not the old piracy gang coming back for one last cut of the pie. You may recall the brief fury that flamed after the German designed Dreambox was introduced. The Dreambox was (remains) an encryption system unique to itself - had it been introduced by a major name brand firm, it would have created billions in sales for the owners. But because it came out of group that had (by its own admission) been active in the hacking business, it was doomed to be a 'clique success' - like buying the fastest street rod or the biggest TV screen in town.

But Dreambox served as a school for an entirely new generation of would-be hackers. Have they made Irdeto 2 their target? No, I don't think so. The 'Gamma' hack (also known by many other names including grandma) appears to be software adaptable to Irdeto 2 variants - such as the Australian software, much as NDS NZ is unique and NDS BSkyB differs from NDS powered DirecTV in the USA. Technically, Gamma, like Dreambox, deserves to be elevated as a conditional access system in its own right. Alas, it is pure commercial piracy raised to a new level of business plan which could have come directly from a Havard MBA PhD thesis.

That is one of the reasons why I come to the conclusion the people behind this are not descendants of the MadMax and Trons of an earlier era. The old guys believed in horse power, and stealth consisted of being one step ahead of uninvited knocks on the door at midnight. I would not be shocked to learn (if we ever learn) there is a sizeable corporate effort hiding several legal layers removed from Gamma where people who arrive to work in chauffeured limousines and dressed in $2,000 suits review their business plan progress while sipping on morning tea served in silver mugs.

One service at a time appears to be Gamma's business plan; "**follow the money**" working through a world-wide list of Irdeto 2 protected service providers. Pick geographically distinct targets, rated by the number of existing authorised card users for each, plant the Gamma "seed" through hand selected regional distributors and place strict controls on the distributor to follow a firm set of rules regarding card duplication and security. And those who violate corporate policy? They vanish never to be seen nor heard from again.

"*Now, can you refill my mug with tea, mate?*"

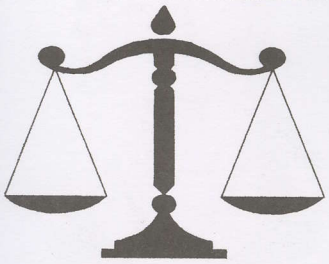
August 15, 2007

At risk: follow the money trail to Asia-Pacific targets

I2/PAS2-169E:
World Media International 3.833V
I8/PAS8-166E:
Australia Pacific Net 3.829H
SelecTV (3 transponders)
ABS-CBN 12.575H
MySat 12.646H
JadeWorld 12.686H
Pan Global TV 12.726H
C1-156E:
Austar
Aurora
Foxtel
B3-152E:
Globecast
Sky Racing
UBI
WIN/GWN 12.737
Superbird-144E:
Access TV 12.718V
Apstar 6-134E:
CCTV 4160H
AsiaSat 4-122E:
DCM 4020V
Skywave TV 11.727 + 3 more
AsiaSat 3S-105.5E:
MTV Pakistan, Filmazia 3760H
Sahara One & Filmy 4020V
TVB 4111H
AsiaSat 2-100.5E:
Vision 2 3960H
Measat 1-91.5E:
World Fashion 3924H
Thaicom 5-78.5E:
Live 3920V
NBT 12.313H
Thai Mux 12.399H

-On the cover-

The product life cycle for the Atmel 7272C super computer in a card; the hardware for the new 'Gamma Hack'.



LETTERS

ET? Color Purple?

"As a long time fan of your writing dating back to the early days of the Big Dish home satellite reception, I am looking forward to more reflections about the pioneering technologies. I am a cinematographer (in features our credit is Director of Photography) and was credited for a number of memorable films (ET, Color Purple, Empire of the Sun, Avalon, Bugsy, Fearless and Van Helsing). I have always been fascinated by the development of television and video technology, and vividly remember at age 12 seeing my first color TV on an RCA CT-100. This started it all for me and I see no reason for this fascination to end. I eagerly anticipate reading your latest reflections - you are finding facts that posterity will cherish!"

Alan Daviau, Los Angeles

Alan is commenting on a chapter from "Television: The technology that changed our lives" which appears in advance of publication of the full book under the Early Television Foundation (www.earlytelevision.org/) site; click on Early Color, scroll down to 'More on early colour', and finally "Bob Cooper's Article on CBS color" - this is truly an awesome TV historical site.

Noise gone?

"I have now seen and installed the latest (current) version of Zinwell receivers and am pleased to report *'the noise is gone!'* And this levels the playing field between Hills/Zinwell (the ones with TVNZ technical approval) and the balance who are slugging it out for that 20% of the market Steve Browning has so generously allowed the non-approves to sell to."

Robert, NZ

Browning recently surveyed the non-approved suppliers, apparently attempting to create a 'Total Freeview STBs in service' count. Several of these reported back to SatFACTS their numbers - setting aside Zinwell and Hills, it appears as of 1 August the number of non-approves imported and sold through at least as far as a dealer (if not yet in user hands) is around 4,200 new sales from May 1st.

PROGRAMMER PROGRAMMING PROMOTION UPDATE

AUGUST 15, 2007

The plague is back - Irdeto 2 (Foxtel, Austar and late in July UBI) piracy cards have appeared, in quantity, in Australia - street selling in the $200-300 range. They are even on eBay at lower prices - some as low as A$60 which has all of the characteristics of entrapment by Irdeto who are most assuredly giving this the highest priority. With new, much strengthened anti-piracy legislation now in place, major time in the pen and significant dollar fines make the risk of playing in this new get-rich-quick(er) scheme more dangerous than ever before. The easiest way to escape 'plague infection'? *Stay out of the game* - this one has all of the earmarks of getting nasty, *fast.* Our report, page 7 plus a technical look at the magic chip, page 20.

Irdeto 3? Go to Lyngsat on the web, Measat 3, 4040V and notice the parameters for 'World Fashion Channel International'; yes, it says encryption is 'Irdeto 3'. A possible hidden-away test of the next generation of Irdeto, now that 2 is in deep DPSC? A smart guess but wrong; there is no such thing as Irdeto '3'. Irdeto 2 was called '2' because the cards that replaced the first ('1') version were software version 2.1. Version 1 had the nanos sent over the air in the clear which of course became the root cause of Irdeto's hacking. Version 2.1 encrypted the nanos and the next card version to be released was 4.1 (there was never a '3'). For the record, Irdeto's basic encryption has not changed from '1' - it has been refined and adapted to changing hacker skills. The latest version is 5.5, in use by UBI.

Stratos? The Freeview package will add yet another new service (following TVNZ's TV9 starting September 30) "in October" - as soon as the first but the actual date not yet set. It comes from the same folks who have created the Auckland and Wellington Triangle TV service. Stratos will serve a dual function - first as a free to air programming package which will allow independent producers to air material which has not previously been on any of the 'big 3'. Simultaneously, the Freeview feed will be available to New Zealand's handful of often struggling "independent stations" (Nelson, Christchurch, Rotorua - plus) to use the satellite feed for terrestrial rebroadcast.; call it a "network" and this offers the potential to change the way programmers can reach an audience without being pushed through the constrictions of the TVNZ and TV3 funnel. This has the potential of doing more for a broadening of television production in New Zealand than anything announced to date for Freeview; congratulations Jim Blackman!

ViewTech goose cooked? Asian based, California operated firm has been cited for producing FTA receivers (under various market names including Viewsat) capable of decrypting Nagra 'protected' DISH (TV). SatFACTS reported on status of North America's piracy (#153-154, p. 27) in some detail; DISH (EchoStar) claims "2 million illegal STBs have been sold," there.

Rubbish and C-Tick

"I would hazard a guess the same root is beneath the rubbish coming out of the Zinwell box (SF#155, p. 20) and the misunderstanding so many apparently have concerning which receiver aspects C-Tick impacts. EN55013 (or CISPR 12; it goes by many names) has to do with *conducted and radiated emissions* from certain categories of consumer electronic kit. Full stop.

"I could easily make a box pass EN55013 but present rubbish on the outputs. It is simply a matter of specifying the performance parameters that matter, with figures that are reasonable and making sure the submitted sample actually performs to those specifications.

"I am betting that a careful inspection of the video and audio outputs for this receiver will reveal the inadequately decoupled power supply rail you describe is also adversely affecting the S/N (signal to noise) quality; either it does not meet spec or the spec is unreasonable for the situation.

"Although Freeview is a FTA service, it is going about things as if it were more like BSkyB where it behoves the broadcaster to get his stuff right as the box is the basis of his business. Yet what you report suggests to me that somewhere along the way somebody has dropped the ball and more problems are likely to become apparent over time.

"The bit on the bottom of page 21 is a bit of a laugh; the only point that might be valid is approved receivers will have applications software that will find new service components without user interaction. Is this really an important attribute? Likewise macrons - as if Maori is the only language with diacritics or even the first with diacritics to be transmitted. Pull out a copy of EN300468 (DVB-SI spec) and look what it has to say about characters in Annex A. Like diacritics do not exist in Unicode?"

B. Graham, Hong Kong

C-Tick approval can now be eliminated from the power supply rail noise equation - leaving us with performance issues outside of being legal or illegal. The Zinwell to the best of our knowledge is NOT violating any C-Tick measured items. As for the performance issues, a firm with the resources and integrity of Zinwell can be expected to correct the apparent design faults. Perhaps at the end of this episode the NZ importer will also have learned more about PR.

HARDWARE EQUIPMENT PARTS UPDATE

AUGUST 15, 2007

Freeview in Australia! A hobbyist with a few hours access time to 13m dish in Victoria has found New Zealand's 12.483Hz signal with a measured 8 dB C/N signal. It locks and is stable (TVOne, TV2, Maori) but very gentle dish adjustments dropping the signal to 7 dB C/NR cause it to unlock. Don't try this at home!

SKY NZ deserves a bouquet. Their July 31 switch from Optus assigned D1 beam back when D1 replaced B1 has finally come full circle - horizontal on D1. And with very minor hitches - they were few - an estimated 600,000 set-top-boxes were seamlessly converted from vertical to horizontal, apparently the largest such switch-over in the world history of satellites. A 'non-story' p. 9.

Traces or tracks? SF#155, p. 21, photo caption read, "*Copper on the circuit board replaces wiring - known as 'traces'.*" Perhaps only in our head! Traces within the electronics world normally describe lines on a CRT (cathode ray tube) such as one finds with an oscilloscope or spectrum analyser. Tracks on the other hand include those spiral circles one finds on a floppy disk. And the copper-based lines left on a circuit board after the etching process (see RS Components catalogue referencing SRBP circuit board blanks ("*copper tracks bonded to SRBP board and pierced to accept terminal pins*"). Way (*way!*) back in 1971 when this editor was designing the first 'Interdigital printed circuit bandpass filters' he elected to call the "copper tracks" left on the board after etching as 'traces', a reference to the pathways followed by the RF waveforms (as in, "*tracing a pathway from input to output*"). Several readers called us on this - it appears they are correct and we are living in the past!

Y-Max? Other readers ponder whether 'Y-Max' (SF#155, p. 14) is the same as WiFi-Max. *It is* and we admit to creating this term primarily to shorten the amount of page space required each time we use the term (WiFi-Max). Sometimes our self-created terminology catches on (example: Clarke Orbit Belt; 1979) but more often it does not. Let's see how this one works out!

Will the REAL Hyundai importer please stand up? SF#155, p. 4, said: "*A Hyundai receiver available through one distributor per island is imported by hyundai@nzljohn.co.nz.*" A letter dated July 28 from UltraPower Technology Co. Ltd disputes that statement; "UlltraPower, a privately owned New Zealand company, is the sole agent for importing, distributing Hyundai satellite receivers, providing after sales service and support in New Zealand for the past four years. (Jack Del Toro, MD as www.ultrapower.co.nz, email ultrapower1@hotmail. com)."

New owners?? http:www.austech.info, popular with hobbyists and others who are into creative thinking, has apparently changed hands. The site has been in the forefront of reporting on the Gamma Plague. Apparent new owners, renewing site registration for 5-year period, are headquartered in Holland. Remember Lee Gibling and THOIC site from UK back when old-timer MadMax was jailed in Thailand? One plus one *may* still equal two.

Phoenix Technology Group

Satellite Equipment & Accessories One Stop Supermarket

Phoenix 2.35m Motorized Extra Heavy Duty Mesh — $180 each, Buy 10 get one Free!

Phoenix 2800A $90
The Best FTA Available
Quantity price available

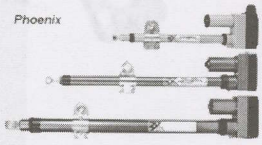
Dreamax DT470 $90ea
Irdeto 2 Rec min 5 buy
Perfect For Selectv

Zinwell 15K
LNBF $24/each
for box of 24

H-H Motor $85ea

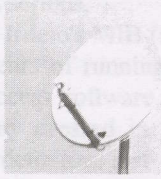
SuperJack EZ2000
Positioner $50/each

Star V Box II
DiSEqC1.2 Positioner
$45 each *how low is this*



Actuator from 12' standard duty to 36' heavy duty
From $35/each to $220/each

RG6 305m
Dual shield
$70/box
Quad shield
$80/box



Folding Arm Dish
best dish for caravan kits
35cm $80 each Inc Case
64cm $25 each Wide Beam
78cm $44 each Aurora
88cm $55 each Hi Gain
Made in Denmark

Local Antennas Full range
In stock Now From $25 10 buy

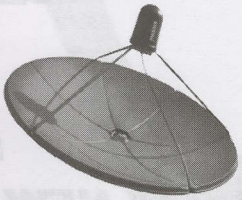
Caravan Digital Ant	$80	PBI C+Ku band LNBF	$65
Facia Mounts TV 1.8m	$12	Zinwell C band LNBF	$28
65cm KU offset dish	$22	Zinwell Prime Focus KU Dual Output	$60
75cm KU offset dish	$30	Star C band LNBF	$18
90cm KU offset dish	$35	MTI one cable solution LNBF	$45
One leg gutter mount	$18	Satellite finder	$20
Two leg gutter mount	$22	RG6 striper	$15
Tin roof mount	$20	RG6/RG11 crimper	$20
Wall mount	$14	Angle meter	$35
19" LCD Bracket	$50	Compass High Quality	$10
2.3m SD mesh dish	$130	RG 6 Crimp Connector 100 pack	$25
3m SD mesh dish	$340	22K switch	$10
3m HD mesh dish	$380	Two way DiSEqC switch	$10
3" 2.5m galvanised pole	$30	Four way DiSEqC switch	$12
3" 3m galvanised pole	$36	Satellite 2 way splitter	$2.50
3" 3.5m galvanised pole	$42	Satellite $ Way split	$4.50
3" Triangle Pole for C band dish	$50	Digiair Terrestrial hand held meter	$350
Speaker Stand for caravan use Ku dish	$40	Star LED Easy to use Satellite Meter	$75

Kingray MHW-34F
Inc Power supply
$55.00 *crazy*

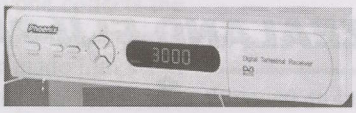
This Months Specials

Phoenix®

Phoenix JT-3300D
Digital Terrestrial Receiver
$68.00 10 buy



Latest Release
Phoenix 1.8m
Solid 6 Piece Dish
C & KU Band
Polar Mount
$135.00
Yes You Can Motorise

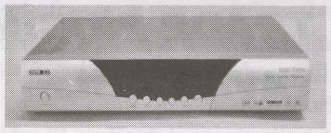


DVR 9200 Twin Tuner HDD Sat Receiver As tested by Coop $490

COSHIP

Coship 5110D
Licenced Irdeto 2 Receiver
Auto Rescan of channels when Powered off
No problems activating cards
No software problems, use a box you can trust!
Best for Selectv/Aurora

$115.00ea
Min 5 Buy
$135.00 ea 1 Buy

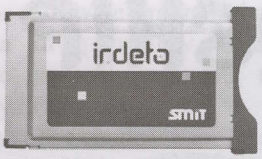


New Star 2880B FTA Receiver
Blind Scan! $70 ea Min 5 Buy

SF-3000
Meter Now Instock
Call for our low price

Great Freight Deals To NZ

Irdeto Cam Version 2.26
$70.00 Trade Price breaks in place for larger Wholesale Qty's



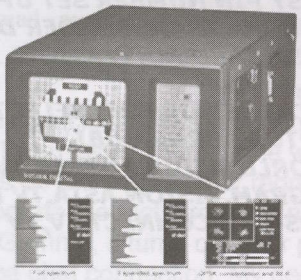
Phoenix 65cm
KU Dish
How low can they go?

$22.00ea

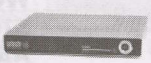
Kingray

SATLOOK Digital NIT
$1395

Satellite-receiver 920-2150 MHz.
- Spectrum-analyzer with expanded spectrum.
- Digital BER, QPSK and S/N-ratio.
- 4.5" B/W monitor for PAL/NTSC/SECAM.
- Tuneable sound 5.5 - 8.5 MHz.
- LNB voltage 13/18v. 22 kHz tone switch.
- DiSEqC control (1.0, 1.1, 1.2)
- KU- and C-band (normal/inverted video)
- 99 memory-positions for spectrum pictures.
- Satellite identification.
- Symbol rate 1-30 Msymb/s.
- RS 232 for PC connection.
- Built in, rechargeable battery.
- Only 5 kg complete with carrying-case.

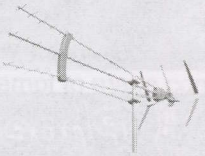


selectv
authorised dealer



Selectv Card & STB
Package $77.00 ea
Trade and Dealers
only on this package

Highest Gain Televes
UHF Deep Fringe
Antennas
Instock Now



Two New Dealers:
New Dealers Welcome

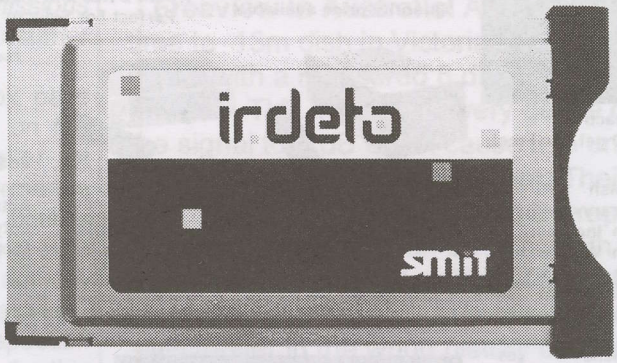
Satellite House 794 High St Thornbury Vic 03 9480 1885
SatPlus QLD Unit 12 /22-26 Cesna Dr Caboolture QLD 07 5495 7674

Website: www.phoenixtelevision.com.au

Phone: (03) 9553 3399 Fax: (03) 9553 3393
E-mail: sales@ptv.com.au

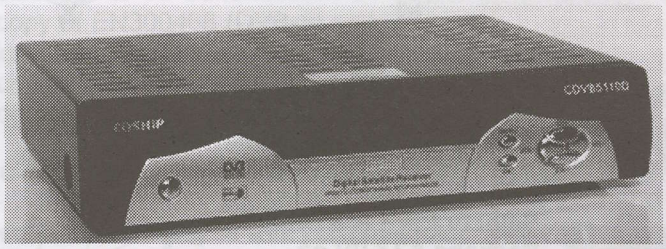
PHOENIX TECHNOLOGY GROUP

EXCLUSIVE



IRDETO CAM
DISTRIBUTOR FOR
AUSTRALIA-NEW ZEALAND-FIJI-PAPUA NEW GUINEA
&
THE PACIFIC ISLANDS
WHOLESALE & TRADE PRICING STRUCTURE AVAILABLE

COSHIP



COSHIP 5110D IRDETO 2 SATELLITE RECEIVER

LICENCED IRDETO SOFTWARE
AUTO LOADING & UPDATE
OVER THE AIR UPGRADING
GLOBECAST RECOMMENDED
COMES PRE-LOADED WITH PAY TV &
EASY PIN NUMBER SET UP
AURORA TRANSPONDER DETAILS
EASY CARD ACTIVATION

AUTO SET-UP FOR: SELECTV, OPTUS AURORA, UBI, WORLD MEDIA, AUSTAR, TVBJ, HTR, SIGRAM, VISION ASIA, TV POLONIA, ABS-CBN, CONNECT TV, TV PLUS

Phoenix®

21/148 CHESTERVILLE RD MOORABBIN
VICTORIA AUSTRALIA 3189
PH +61 3 95533399 FAX +61 3 95533393
E-mail: sales@phoenixtelevision.com.au
Website: www.phoenixtelevision.com.au
FOR YOUR NEAREST DEALER CALL

dba

The **plague** is back

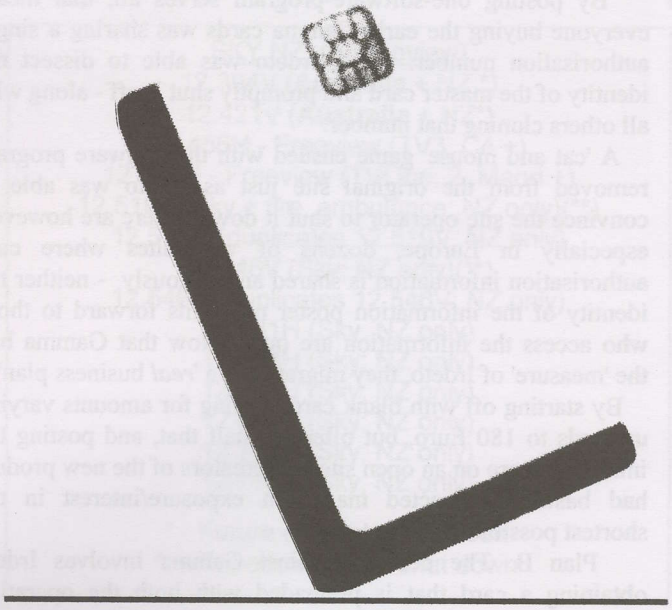
Irdeto 2 format CA breached - "*Just like the old days*"

A man walks into a post office in Malta (the island in the Mediterranean) and stands in a corner. He is dressed in black, he works for Irdeto and because of a breakthrough in Greece where someone has introduced a new DPSC (digital pirate smart card), *Irdeto 2 has been broken.* Not just broken, upgraded outside of the CA authorisation stream and this one is serious.

Irdeto's MIB (men in black) are close to panic mode. After 6 years of running with what is basically the same conditional access software, Irdeto 2, the game is over. Kaput. And the guy dressed in black is staking out the post office because Irdeto has just placed an order for 1,000 of the then-new "Didem" cards to the address in Malta. The fellow spending the day there hoping someone will show up to collect the mail from a post office box (he is ex-Dutch Secret Service - remember Irdeto is HQ'd in Holland) thinks he is being cool. But someone else was there before him, staking out the post office box address, as a precaution before anyone collects the mail. The MIB's Dutch accent and his recently acquired summer time dark tan in the middle of winter made him stand out like Bruce Willits following a gang fight. The folks who created the new breaks-Irdeto 2 cards are far too clever to be trailed from a Malta post office box. What has Malta to do with DPSC? Simply because Malta is like a trade free zone in Europe with no copyright laws and in the old days of Irdeto hacking, last century, it became the centre of DPSC trading.

Irdeto 2 has been more or less immune from crackers since it replaced Irdeto 1. In Australia, I1 was replaced by I2 on Foxtel and Austar after Irdeto cloned so-called Goldcards had become extremely available at pubs, pharmacy shops and through backyard dealers at supermarket parking lots (Optus Aurora continues to transmit in I1 *and* I2 while Austar and Foxtel have switched totally to I2 - and Foxtel simultaneously encrypts with NDS while Austar does not).

"*Here is an* (Australian) *eBay auction - the auction for a functional 'Gamma Card' has just closed at $120.*" Gamma has replaced Didem as the new software became more sophisticated and the reporter to SatFACTS is fascinated by how rapidly the new piracy activity has taken off in Australia. So are we - *disappointed* that Australia has now entered yet another round of widespread availability of a card that



threatens to be unbeatable. We'll tell you why we come to this conclusion.

A too smart card?

Irdeto 2 upgraded Irdeto 1 by containing within itself the computations required to process a CA transmission. The newly available Gamma card elevates the capacity of the internal workings of decryption by a factor of 100 or so. "*The computing power in the Atmel 90S7272C chip, used in the Gamma card, is sufficient that, in 1969, all by itself it could have guided Apollo to the moon.*"

It is a very clever bit of hardware. Someone who orders 10,000 at one time will pay around US$16 each. Of course that is before any programming is entered - the software. A 'super chip' really only becomes 'SUPER' after someone has written a software program that has the potential to process something in a previously unknown area. The Atmel 90SC7272C has no unusual packaging that indicates its power; plain vanilla (above).

The challenge for Irdeto

Under EU law, the Didem card (original 'name' for present Gamma) could be openly sold *provided* it was not loaded with

"Don't call me!" - Coop

I have agonised concerning including this report in this issue. It is about a subject we hoped would never return, at least here in the Pacific. From issue number one we have attempted to provide 'leading edge' development reports and anything that impacts on the progress, or regression, of the development of satellite TV is 'fair game'. I found it surprisingly easy to separate the facts from the rumours here and while I elected to not attempt to make contact with the people behind Gamma, it turns out their protégés are everywhere and the facts and figures quite literally poured out of my Skype chat connection. My decision to publish is based upon a single decision - a very large number of people are potentially at risk when they invest in a Gamma card. And not just for the $300 or so they may risk in one of these devices. Those who acquire a Gamma card are immediately a prospect to have Men in Black (MIB) knocking on the door, attaching your bank account, tapping your telephone, pawing through credit card records. Today's (Australian) law is much tougher on those who breach conditional access than the law that existed back when Irdeto 1 cards were hot ticket items at boot sales and Friday night pub events. Cross over the line and the odds are good you will have the line cross over you with reckless abandon.

software at the time of sale. The buyers received an Atmel AT90SC7272C empty card and were initially sent to a web site (http://www.gammacard.tk/) from which the actual software to activate the card was housed. This was actually a 'test' on the part of the card developers to gauge the reaction at Irdeto. As you can see (right) Irdeto was not pleased and when you go to this site now you are advised, "*This web site was closed by Irdeto.*"

By posting one-software-program serves all, that meant everyone buying the early Gamma cards was sharing a single authorisation number. Yes, Irdeto was able to dissect the identity of the master card and promptly shut it off - along with all others cloning that number.

A 'cat and mouse' game ensued with the software program removed from the original site just as Irdeto was able to convince the site operator to shut it down. There are however, especially in Europe, dozens of web sites where card authorisation information is shared anonymously - neither the identity of the information poster nor trails forward to those who access the information are open. Now that Gamma had the 'measure' of Irdeto, they migrated to a '*real* business plan'.

By starting off with blank cards selling for amounts varying upwards to 180 Euro, but often for half that, and posting the initial software on an open site, the creators of the new product had basically attracted maximum exposure/interest in the shortest possible time.

Plan B. The defence against Gamma involves Irdeto obtaining a card that is preloaded with both the operating software and the authorisation code that originates with a single, legitimate (paying) customer. Once they have the card in hand, the pathway to the authorisation number buried inside is not protected. However, everything else in the software is buried behind multiple layers of encypted-encryption. We'll return to this point.

Knowing the single paying customer authorisation identification, one entry at the service authorisation centre shuts off that original card and all others using the same cloned identifier. Back during the Irdeto 1 days in Australia, the creation of piracy cards was widespread because original cards were being copied and the copies were being copied and these third generation were copied again and so on. The owner of the 'real card' very possibly had no knowledge of this happening - thousands of piracy cards all sharing his 'original' number.

Greed. It was easier, quicker, cheaper and more profitable to keep cloning the same card again and again than setting some limits on how many would be slaved or cloned to a single 'real' subscription card. And the more cards sharing the same number in circulation, the chance that one of these same-number-cards would be collected by Irdeto, and the number turned off, increased.

Returning to 'Plan B' with the Gamma cards, protection layer number one. Think of a franchising type of business. Gamma sellers qualify to be a part of the operation by purchasing a set quantity (100 is common for a new entrant) of cards and software for that quantity. They have agreed to limit same-number cloning to a maximum of 100 Gamma cards and when they require a new order of cards a slightly different set of software arrives with the new card blanks. Their logic here is that each 'card *cell*', by being limited to 100, reduces the chance that some enforcement group will stumble onto a card from a particular cell set.

Site closed after legal action by Irdeto

ir.deto

This web site was closed by Irdeto

Please report any piracy issues to

Some quick math. If 10,000 cards go into circulation, there would be 100 'master' real subscriptions to a provider's programming package to support them.

But, alas, a card still ends up in the hands of Irdeto and 'only' 100 of using that cell go silent. Now we have 'Plan C'.

Because the real power and software skills are *not* in the hands of the local reseller of cards (i.e. nobody is likely to be recloning one of the Gamma cards; see p. 20), if a cell "goes down" the dealer gets in contact with the Gamma source providing identification of the card cell batch. The dealer has been promised that "within an hour, 24 hours a day, 7 days a week," a new set of software specifically for that group of 100 cards will come back - yes, using Internet.

At that point the dealer has two choices:

1/ Physically regaining possession of each of the cards in the cell and reloading with the new customised software, or,

2/ Where a dead-card-user has the necessary skills, use Internet to forward the new data and allow the user to load the card.

Obviously there is more to this than we know or are able to explain here (no secrets - we are hiding *nothing* we know and contacting us for "more detail" will not accomplish anything but wasting your time and ours as well!).

Irdeto fixing this breach?

Irdeto reportedly warrants any pay TV provider using their system cards that if someone hacks Irdeto 2 within two years time, Irdeto will somehow compensate the program providers. After 2 years, the provider has to accept whatever the deal is for the next level of encryption - such as a 100% universe change-out of all existing cards.

There are conspiracy theories which suggest an interesting 'business plan' possibility for Irdeto and there are those who believe this 'break through' with Gamma could be part of that; where I2 has been in operation for longer than the warranty period, create an 'incentive' for introduction of the newest and latest CA. We have no opinion of course on this but the fact is the very latest cards are called Epsilon / Zeta, using version 5.5, which has uses over the air updateable cards with Flexiflash (UBI uses this). And whereas the present I2 cards sell to programmers in the US$20 region, Zeta cards will be at least twice as much; all going to the coffers of Irdeto. We have no proof Irdeto would purposefully create such a scenario of course.

Summary

Piracy of Irdeto is back; not good news. But by its very business format, we can hope a smaller threat to industry stability than the original MOSC and DPSC open world of yesteryear.

Think of the worst challenge in TVRO -

Now multiply the problem by 10: SKY NZ does a massive switch to Horizontal

More than 600 thousand STB decoder boxes were given new instructions on Tuesday, July 31; "*Forget everything now in memory and listen carefully - new instructions are coming.*" Rewind to the beginning.

Orbital Sciences, a USA firm best known for supplying antimissile and missile hardware to the American military, has built and delivered a new satellite (to be known as Optus D1) to Ariane and the satellite launches successfully (October 13, 2006) and drifts with no problems to 160E. After deploying the fold-out solar panels to acquire power from the sun, routine testing begins.

D1 is a Ku-only satellite with 24 transponders. Somewhat uniquely, not a first-ever but close, D1 will use some of these transponders twice - once through an antenna directed at Australia and again on the same transponder frequency to a second antenna boresighted to New Zealand. That means there are a number of interconnecting waveguide-cables involved - one group of transmitters for "A" and a second set for "B". One assumes the connections when the satellite is being completed at the Silver Spring (Maryland) factory were clearly labelled - such as "transponders 1,3,5 etc. A" (Australia) and another connection marked something like "transponders 1, 3, 5 etc. B" (New Zealand). And the antenna connections would be similarly marked.

Well, either the cable/waveguide end or the antenna end was apparently mis-marked. Or, well - human beings who could not read and comprehend. In any event, in one of the most embarrassing (and potentially expensive) mistakes in the history of satellite construction and launching, D1 ended up in position with the wrong transponders pointing at the wrong country. (PAS-8 had a similar but not identical assembly problem on C-band, also not discovered until the satellite was in orbit.)

So where now brown cow?

The original plan was for the high powered NZ beam to be on vertical polarity primarily because B1 (the satellite D1 replaced at 160) major customer SKY NZ had more than 550,000 already functional customers on that polarity. And the at the time not-yet-functional NZ 'Freeview' service would also be on vertical. Unfortunately because of the cable/waveguide connection mistake, the high powered vertical beam actually went to Australia - not where SKY's customers reside. The solution with D1 operating was interim: A less powerful vertical beam became temporary home for SKY while Freeview would launch on horizontal using a beam which was supposed to go to Australia but because of the wiring mistake ... well, if you are trying to draw this out in sequence, you can begin to see how the Orbital Science guys could have gone down the wrong path.

OK - making the best of a bad situation

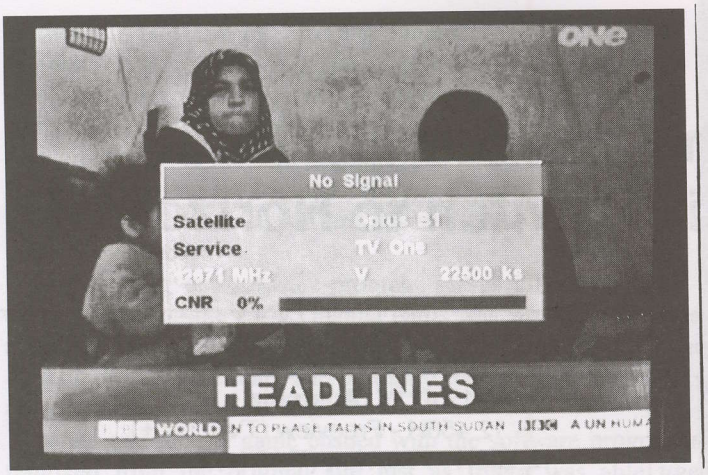
OSC screwed up - something they do not admit in public of course. It wouldn't look good for a prime weapons contractor to the present American administration to be tagged as incompetent - "*stay the course.*" And there is the matter of being paid after delivering to orbit for Optus a defective satellite, while hanging in the balance a contract for D2 and D3. The original plan was D1 at 160E, D2 at 156E to provide both NZ and Australia beams expanding the bandwidth required by both country's pay-TV services co-locating with C1, and D3 at 152E where B3 is in the final chapter of a useful life. That was *before* the wiring mistake.

Now - well, the options are complex and you can pretty much discount any announcements from Optus as having value. Until D2 is ready to launch (late this year would be wildly optimistic) at which time the then-status of B3 can be evaluated, it is a crap shoot.

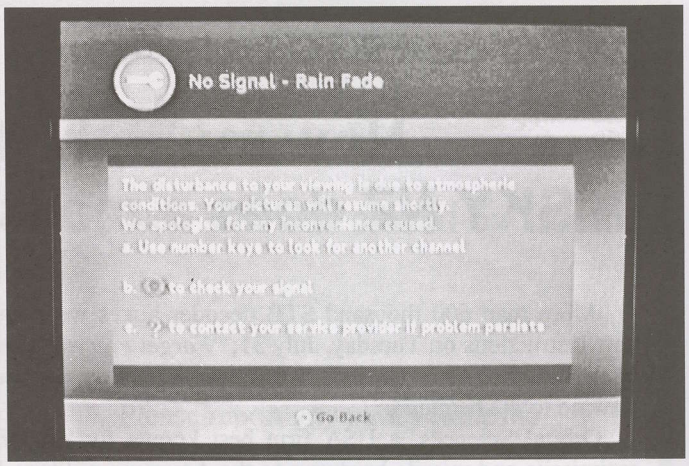
So what needs to be done, first, is to straighten out the SKY NZ situation. If your legal background suggests, "Hey - Optus is responsible (they in turn can hold OSC responsible) to get SKY NZ a certain level of signal on an agreed to number of transponders" and this has to be done by manoeuvring your way through the unexpected restrictions on D1 as it really exists - not as it was planned.

SKY NZ (+ Freeview)
12.394V (**Australia** + NZ *)
12.421V (**Australia** + NZ*)
12.456H - Freeview (TV3, C4 +)
12.483H - Freeview (TVOne, 2, Maori +)
12.519**V** (Sky + fire, ambulance; NZ only)(**)
12.519H (duplicates 12.519V; NZ only)
12.546**V** (Sky; NZ only)(**)
12.546H (duplicates 12.546V; NZ only)
12.581H (Sky, NZ only)
12.608H (Sky; NZ only)
12.644H (Sky; NZ only)
12.671H (Sky; NZ only)
12.707H (Sky; NZ only)
12.734H (Sky, NZ only)

* - Future use not announced
** - Scheduled to be shut down



Moment of switch-off; last image transmitted on 12.671V frozen in memory.



If Sky STB was switched off at 1AM July 31 - message greeting Sky receiver users when next switched on.

(As an aside of how far this mistake stretches, the New Zealand uplinking firm Kordia - previously BCL - does not start a money-payment contract term with Optus until October which suggests that as partial compensation to the 'injured parties' following the wiring error *perhaps* Optus has allowed Freeview and possibly SKY as well to be on D1 without charge since this fiasco started.)

The big switcheroo

So your 'universe' is around 600,000 functional STBs, some dating back to day one when the supplier was PACE and the receivers came equipped with dual SCARTs (a later version came without SCART). The range of receivers, LNBfs, covers more than a decade. The current software version which all receivers should have is 0350 (3.5) but if someone had their STB turned off when various updates were transmitted - well, there would be problems. Basically, all 600,000+ STBs need to be told to switch polarity and reconfirm their reception transponder frequencies. And then there are the non-TV and radio services. The New Zealand St. Johns (ambulance) and fire services, for example, which have been using 12519 on vertical have now switched to 12.519 (stream 3) on horizontal. But these special services, going nation-wide to local ambulance and fire stations, are using older (PACE) receivers with software version 2.50. (When Kiwis call 111 for fire or ambulance, the call centre goes through a SKY interconnect to contact the specific local department from whence the call originates.)

In advance of July 31, the anticipated #1 trouble call area involved the status of LNBf's and whether they, upon instruction, would in fact be responsive to instructions to switch polarity. In theory, on paper, if SKY shut down at 1AM July 31st, the last message they would transmit to all of the decoders would be to switch from 13 volt to 18 volts LNBf - effectively telling the STBs to leave one polarity (vertical) and go to the opposite polarity (horizontal). Then having sent that message, in theory all of the STBs would be sitting on horizontal awaiting the return of signals on the new polarity. They expected this to take "up to four hours" - while the waveguide plumbing was being swapped over on the uplink transmitter and antenna system. When that was complete, the transmitters would refire again with the change being they were sending horizontal signals in place of the vertical (uplink) signals. If Optus had the satellite properly "cued" the transponders one by one would reappear on home receivers. That was the theory.

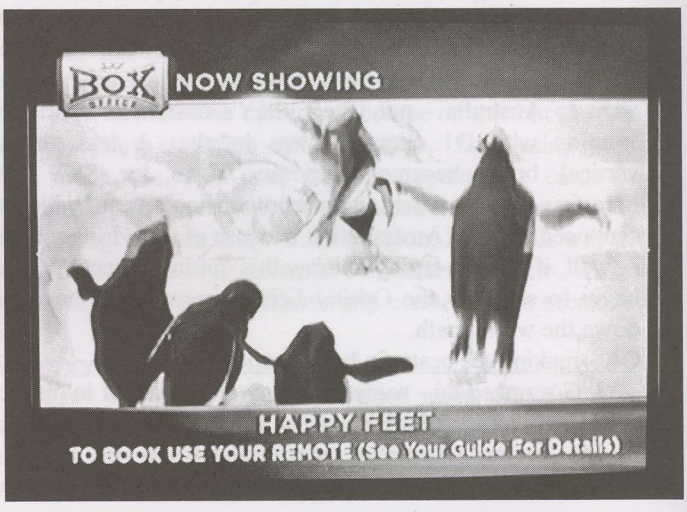
However, if for whatever reason the individual consumer receivers refused to switch from 13 to 18 voltage, they would be on the incorrect polarity. Which brings us to the love and care exercised by the last person who adjusted the LNBf - the installer. If the LNBf probe was accurately adjusted for nulling of the opposite polarity, and the switching circuit worked properly, no problem. But - if the LNBf adjustment was 'out' by ten degrees or more (not a hard number - different model LNBf will be of varying tolerances to cross pole or peak signals), the new horizontal polarity could be degraded - enough to increase the occurrence of 'rain fade' for example. In other installations, after years of supplying 13 voltage to the LNBf, the receiver may have internal soft or hardware problems when asked to switch to 18 voltage. It was to be a 'giant crap shoot' and SKY installers could be in for a memorable period of revisits.

To their complete credit -

- none of the above happened. The team at Sky deserve full credit for making it happen without attracting negative press coverage. In fact - in the best of ways - there was virtually no coverage at all - a non-event.

Our research suggests this was the largest polarity-swap -move in satellite history (by way of counting the number of affected receivers) and it occurred without attracting any attention - including ours. Well done!

Recovery phase - some receivers came back on after switching to the Box Office Preview channel.



SEPTEMBER 2007 - SATFACTS ISSUE # 157
Begins the 14th year of publication!

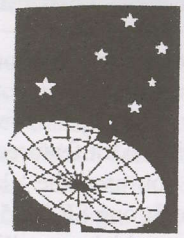
Readers in 63 countries world-wide; technology journalism which only Coop could create (he has been doing this since 1956) because after 51 years of reporting, he has the contacts and friendships that produce material way ahead of any other sources - always in great depth.

Advertising in SatFACTS

Our format limits the amount of advertising space and normally we are pretty much full. But there is (about to be) space for one FULL PAGE advertiser and space is currently available for two 1/2 page advertisers. Usually - not always - we can squeeze in a quarter or eighth page even on short notice. The majority of advertisers sign up for a full year to receive the lowest rate and save a further 10% by paying in advance for the year.

Join us for year 14 - contact Coop at

skyking@clear.net.nz, telephone ++64 9 406 0651
or fax ++64 9 406 1083.



Tetris? Sokoban?? Snake???

What plays MP3 files, satellite TV, games and calculates?

The Strong SRT4654X!

As the merging of similar technologies, all based in the rapidly expanding digital world, continues to race ahead at break neck speed, we are approaching a point in time when one appliance - let's call it "Digital Universal" - does virtually every function most people require to live a happy, healthy life.

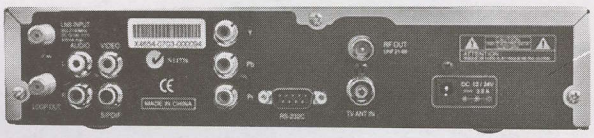
Traditional product designers with their minds stuck in a design box continue to crank out products such as STBs but never stray very far from the primary function. Others are crossing product functions with wild abandon - a refrigerator with a LCD TV screen built in; a bathroom mirror to hang on a wall - another LCD screen not only built-in but virtually invisible when it is turned off. Combining television with a wide range of unrelated products testifies to the growing attachment the world has for never being out of eyeshot of moving images.

MP3 and similar audio storage/retrieval systems also lend themselves to being married to seemingly unrelated products. Decades ago when transistors became functional to build AM (and later FM) radio receivers, out-of-box designers crammed circuits inside of stuffed animals, replicas of soft-drink bottles, loaves of plaster of Paris replicated bread - and hundreds more (*).

State of our art satellite set top boxes already combine multi-functions; receiving a variety of FTA and CA television, providing power and aiming skills to physically move a satellite dish from bird to bird, satellite originated radio (and data). Some also add antenna aiming calculators (you tell it where you are in latitude and longitude and after locating a single reference bird, it creates the correct azimuth and elevation for all other satellites in your arc).

That said, most users do not have motorised dishes (although increasingly two or more LNBf per antenna is a growing trend). Most buyers are after a variety of services, in or out of conditional access, and a menu system which reduces to a minimum the technical skills required to wander from channel to channel or bird to bird. Hobbyists love extra features but the typical user is not so inclined.

SRT4654X is Conax CAS7 endowed making it compatible with Aurora Irdeto. Powering is by a 12V/24V DC external box, advanced blind scan and component video output + USB 2.0 connectivity.

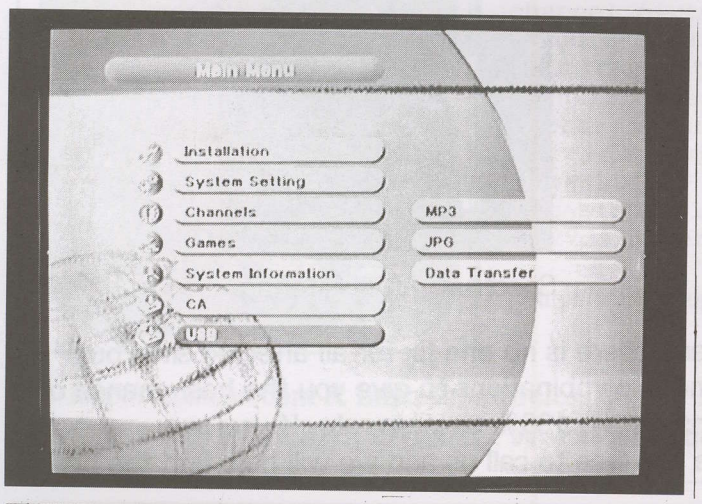


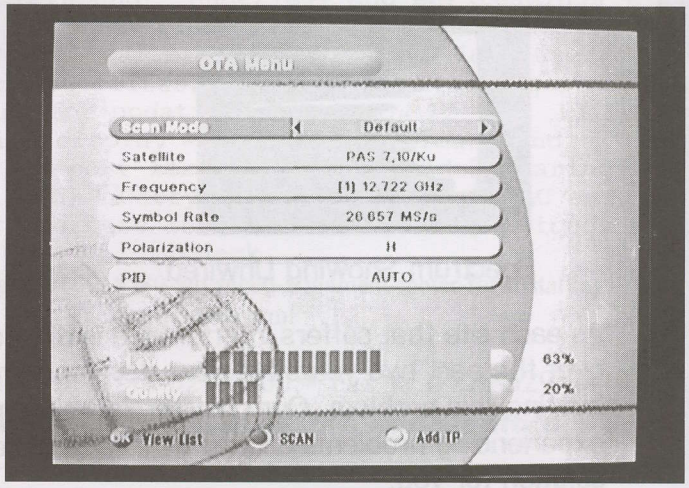
*/ Today such 60-60's 'novelty radios' sell to collectors for thousands of dollars!

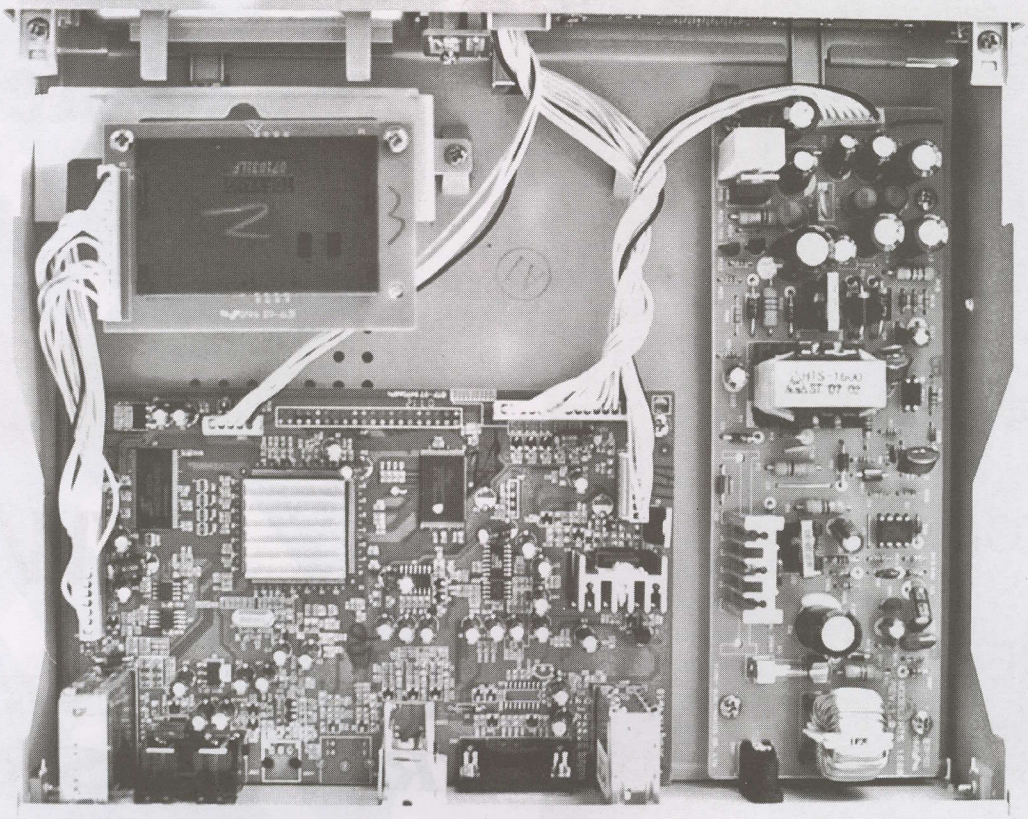
Still, there are marketing edges to having extra features built into a product (when was the last time you used the 'elapsed time' function on your wrist watch?). The Strong SRT4654X is a new satellite receiver with some extras, which we will note shortly.

Basically, this is a full blown FTA and CA receiver with up to date software offering blind scan of FTA or CA signals. It does not care whether the input is C (5.150 L) or Ku (such as 11.300, others) - covering 950 to 2150 (MHz), with a 10,000 channel memory storage. Channels can be sorted, arranged, deleted, grouped - just about any way you wish. Scanning with a motorised dish (or multiple LNBf installation) can be

Primary 4654X menu is straight forward and will not perplex anyone who has set up a receiver previously.







accommodated unattended. Blind scan (no prior knowledge the transponder or service exists) adds to a previously established data base only those channels new since the last scan. Favourite channel groups (16) act as quick-find sub-memories allowing you to collect channels of similar programming or interest. Dish controller DiSEqC includes version 1.0, 1.1, 1.2 plus USALS.

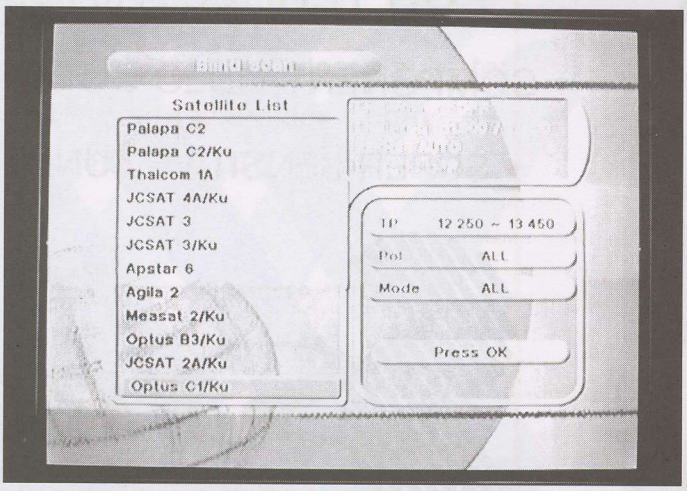
Video output includes component (Y, Pb and Pr) in menu selected 4:3 or 16:9 versions; 720 x 576 pixels in addition to the normal composite. Assuming a suitable video receiver/monitor, once you begin using component it is our opinion you will never switch back to composite. No, we are not talking high def (yet) but the improvement in image quality is enough to immediately cause you to begin 'grading' the megapixel rate of the various channels; the low grade ones really stand out.

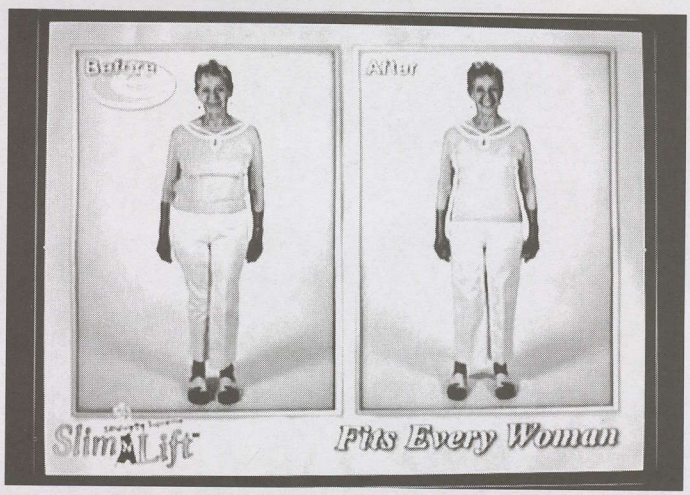
Scanning

There are several choices: One transponder at a time on one satellite, all transponders on one (or both) polarities as on one satellite - using factory entered transponder information, Blind Scan of one transponder, one polarity, one satellite or all satellites you select from the master memory in either factory entered or "blind" scanning modes.

Blind scanning is the current rage and it works by entering what you wish scanned and then turning the machine loose. Blind scanning is a software art and it divides the spectrum up in small bite size chunks and one after the other goes through

4564X is preloaded with 99% of the information 90% of us will ever use.
Images are sharp, clean, especially in component output (Y, Pb, Pr).





RECEIVERS

LNBS

DISHES

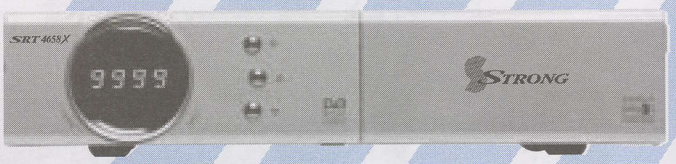
POSITIONERS

ACTUATORS

SWITCHES

selectv
authorised dealer

Robust Digit
Receiving
For Aust



NEW

SRT 4651X SRT 4653X
SRT 4654X SRT 4658X

RANGE FOR SATELLITE

- FTA / CI / CONAX CAS7
- COMPONENT VIDEO OUTPUTS
- ADVANCED BLIND SCAN
- USB 2.0 INTERFACE
- SUPER SENSITIVE TUNER

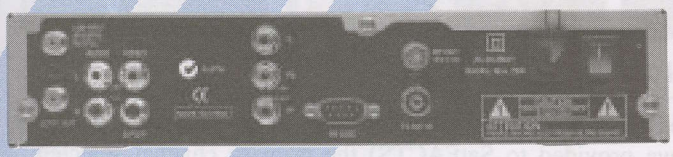
SRT 5020

FOR TERRESTRIAL

- COMPONENT VIDEO OUTPUTS
- SUPER SENSITIVE TUNER

STRON

tal Television
Equipment
stralasia



Interested in purchasing or distributing STRONG products?

contact us for more information

STRONG TECHNOLOGIES PTY LTD.
60 Wedgewood Road, Hallam
Victoria 3803, Australia

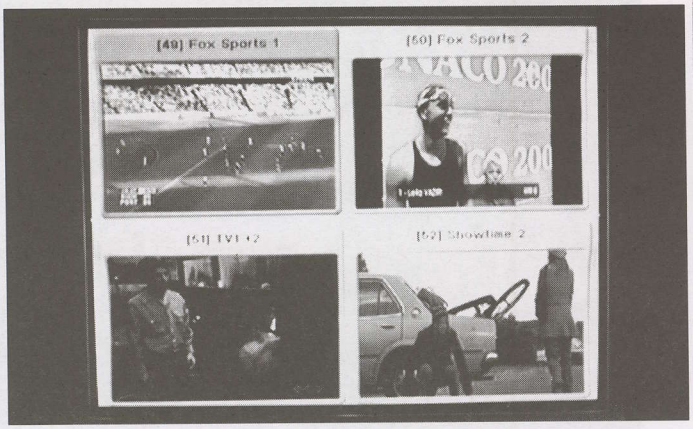
Phone: (+61 3) 8795 7990
Fax: (+61 3) 8795 7991
Email: asales@strong-technologies.com

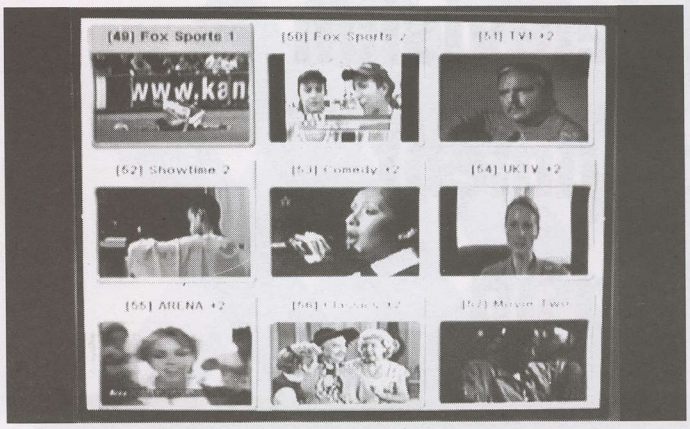
For additional information about us and about our satellite and terrestrial receivers, visit our website at:
www.strong-technologies.com

For technical matters, please write to:
tech2@strong-technologies.com
or call 1 800 820 030

NG

not just by name





2 x 2 (left and 3 x 3 (right) channel displays; see text below.

the master bandwidth you have chosen. There are differences of opinion concerning how this automatic searching works:

1/ First is the size of the bites. Most receivers search in 8 MHz steps (such as 954, 962, 970 and so on upward 8 megahertz at a time), some search in 4 MHz bites.

2/ For high symbol rate transponders (such as any of the Globecast or Freeview) if your search frequency at that instance is within 8 MHz of a signal, the search will fine tune itself even if the MHz is not precisely correct. For low symbol rate services (such as AsiaSat 2's Fashion TV - 2.625) the signal bandwidth is possibly not wide enough to 'capture' the scanner's attention at 8 MHz spacing. Other receivers, such as the new Manhattan Plaza XT-CM, offering scanning step options; 8 MHz and 4 MHz. By halving the MHz steps, the SCPC narrow services are more likely to be found.

The 4654X uses 8 MHz steps. We found a set of 8 transponders on Ku blind scan loads in around 4 minutes time while the full content one a single polarity of As3S (C-band) required just over 6 minutes. The advantage of blind scanning should be obvious - while there are Lyngsat and other references, they are not 100% accurate and there is always a time delay between the appearance of new services and their being reported on the web references.

1, 2, 4, 6, or 9?

With a digital receiver, even on a CA service, the 4654X allows you to select up to 9 separate channels each in individual 'frames' on the screen (above, left). There are limitations to this because each of the channels is sharing one smart card and not all 2, 4, 6 or 9 images are constantly updating (you select the primary one). It works, with the 4564X, in a channel sequential way - for example (photos above provided to SatFACTS) the primary channel selected appears upper left (on this receiver it is Fox Sports 1, channel 49 in the receiver memory) followed by 50 (Fox Sport 2), 51 (TV1 + 2) and 52 (Showtime 2). By selecting 9 (3x3) and staying with Fox Sports 1 as the first, the next 8 are sequential through receiver channel 57, Movie 2 (photo, right). How well does it work? The more channels you select to display, the less often each updates. The top left ('primary') runs for approximately 25 seconds, then sequentially the next update goes to the one above the last two second length update, returning to the primary for an additional 25 seconds; approximately 4 minutes between a full round of updates. Any of the channel displays can be RCU designated as primary so in theory the user can monitor up to 9 channels and select which one is the near-full time display.

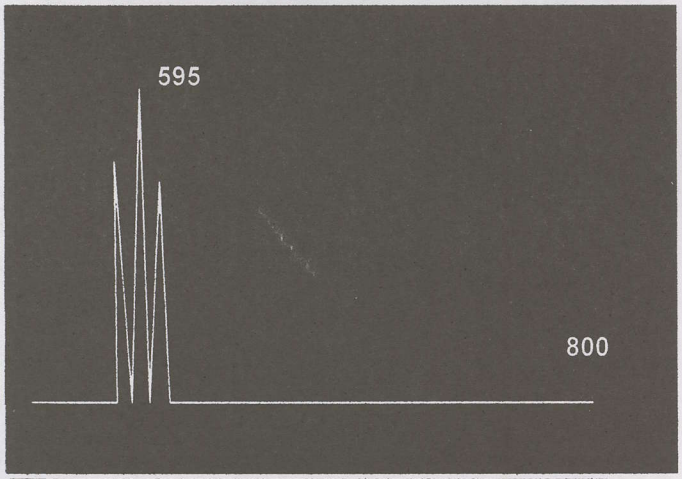
Powering

On the aftermath of concerns created by receivers which use DC to DC conversion for powering, the 4654X enters the fray. DC converters, starting with a 12V external supply operated from the mains (100-20V AC) can be troublesome (SatFACTS # 155, p. 20). At the (UHF) modulator output-terrestrial aerial pass-through, there are no noise artefacts (spectrum display photo lower left). The 4654X will not create problems for you. The DVE model 'switching adapter' is rated at 3 amps (12V DC) output.

Errata

The instruction manual does not adequately cover moving from menu to sub-menus. Performance (sensitivity, video and audio quality) is as good as any competition we have reviewed. A CD with the original operating software would be a very handy addition to load into your hard drive where you could make changes.

4654X is "clean as a whistle" at RF output; no DC conversion "noise" (UHF modulated carrier left).



Summary: Strong 4654X

Source: Strong Technologies Ltd., 60 Wedgewood Rd., Hallam, Victoria 3803 (Australia)
Ph +61 3 8795 7990. Fax +61 3 8795 7991
Email asales@strong-technologies.com
Sr 2-45 (SCPC & MCPC); FEC - automatic; 950 - 2150 MHz. FTA, CA (CI and Conax CAS7); DiSEqC motor control; 13/18V DC + 22KHz LNB switching; USB flash drive for MP3, JPG, data transfer to/from another receiver, channel list transfer. Timer, EPG, DVB teletext, channel password and lock. Hex and dec on screen calculator. Auto/PAL/NTSC. Default language (subtitles). UHF modulator, component video outputs.

Atmel's processing chip family is 'dark art' stuff

Atmel? (*) As we report on page 7, a new ingredient has been added to the constant too and fro always going on just below the surface between the encryption folks and those who would hack their creation. Atmel is a producer of chips which find their way onto circuit boards or moulded within plastic smart cards. They are not the only such supplier - not even the largest or best known. But in certain circles, their lead in chip technology is legendary.

There are two chips of interest here: The AT90SC7272C is the latest and fastest while the AT90SC6464C is already in widespread use. The 7272 is a grown up version of the 6464 adding more Flash and EEPROM Memory. The 'Gamma Card' (p. 7) requires the enhancement of the 7272 to support the relatively large Gamma code.

A smart card

Plastic, ABS or PVC, embedded with a microprocessor including a volatile memory. Standard ISO 7810 defines cards to be 85.60 x 53.98 mm. Within the secure cryptoprocessor of the ICC (integrated circuit card), a tamper resistant system to secure files and resist unauthorised accessing. Smartcards either provide missing information to allow computation of an answer or 'response', or accept raw data from outside and do computing on-board. In our world, 'raw data from outside' is a partial data stream sent via satellite to the receiver where the 'computing' is the calculation of an answer by the card using resident memory information and the satellite data together.

Atmel is a stock exchange listed firm (NASDAQ - 'ATML') and without profits it would collapse and disappear. Profits come from designing new products and selling tons of each. It also comes from creating successful designs that accomplish tasks which others are unable to do. And building in to state-of-the-art products obsolescence; they will expire with time and customers will be thereby encouraged to replace with the yet 'next' generation..

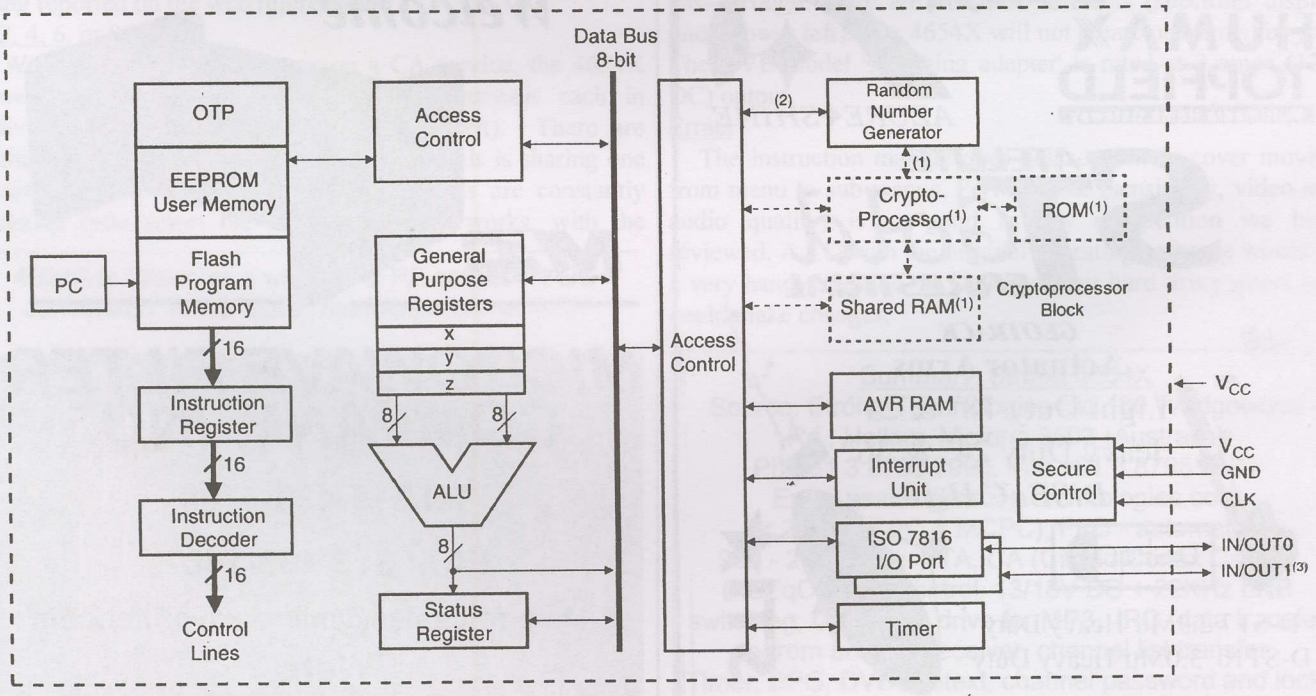
* www.atmel.com but do not expect to find 6464 or 7272 prominently displayed. As one quipped, "*Would you expect to find a police car on display in a new car showroom?*"

Secure Microcontrollers for Smart Cards

AT90SC Summary

- High-performance, Low-power 8-bit AVR® RISC Architecture
  - 120 Powerful Instructions
  - Most Single Clock Cycle Execution
- Up to 64K Bytes Flash Program Memory
  - Endurance: 10K Write/Erase Cycles
- Up to 64K Bytes EEPROM User Memory
  - Endurance: 250K Write/Erase Cycles
- Up to 2.5K Bytes RAM
- Cryptoprocessor
  - Pre-programmed Functions for Cryptography and Authentication
- Supervisor Mode (Memory Management)
- One or Two ISO 7816 I/O Ports
- Random Number Generator
- One or Two 16-bit Timers
- 2-level, 6-vector Interrupt Controller
- Security Features
  - Power-down Protection
  - Low-frequency and High-frequency Protection
  - Logical Scrambling on Program Code
- Low-power Idle and Power-down Modes
- Bond Pad Locations Conform to ISO 7816
- V_{CC}: 3.0V ± 10%, 5.0V ± 10%

Block Diagram



Note:
1. Only available on products featuring a cryptoprocessor.
2. Only available on products not featuring a cryptoprocessor.
3. Currently available only on AT90SC1616C and AT90SC6464C.

A 68 page document clearly labelled "Confidential" sets out the planning and legal rules for the AT90SC7272C, sub-titled 'Security Target Lite'. In this industry, on average 70% of a product's development costs are spent on "verification" of the device - time and effort spent to validate (repeatedly at 7 different stages of development; see front cover) the capability of the chip.

Excerpts from the Atmel manual state:

"*The devices in the AVR ASL4 family* are based on the AVR RISC family of single-chip microcontroller devices. The AVR RISC family, with designed-in security features, is based on the industry standard AVR low-power HCMOS core and gives access to the powerful instruction set of this widely used device. AVR ASL4 devices are equipped with Flash, RAM, ROM and EEPROM, cryptographic coprocessors, and a host of security features to protect device assets, making them suitable for a wide range of smartcard applications.

"*The* (device) *must provide protection* against the disclosure of user data, against disclosure/reconstruction of the Smartcard Embedded Software or against disclosure of other critical operational information.

"*This includes protection* against direct micro-probing of signals not connected to bonding pads, but also other contact or contactless probing techniques such as laser probing or electromagnetic sensing. This also includes protection against inherent information leakage that could be used to disclose confidential data.

"Flash Program Memory: (1) Page size of 128 bytes, (2) Minimum endurance of 10K write/erase cycles, (3) Data retention for a minimum of 40 years. The (chip) contains up to 64K bytes of downloadable Flash memory for program storage. Since all instructions are 16-bit words, the Flash is organised as 32K x 16. The Flash memory is read-only except during the program download mode. This mode is selected by setting a bit in the memory/control I/O register. Once the Flash memory is loaded, a security feature disables the download function making the writing of the Flash impossible.

"EEPROM User Memory: (1) Erasure and writing; (a) Byte-by-byte, (b) Bit mode, (c) Page mode (128 bytes per page). (2) Minimum endurance of 250K write/erase cycles. (3) Data retention for minimum of 40 years. The user memory is organised as up to 32K x 16. A write bit in the memory control register selects byte by byte or page by page mode. During the write cycle, a bit is set in the memory control register, disabling pending write operations. When the write cycle is finished, this bit is cleared and an interrupt request is generated.

"Bit Addressable Memory: *The 64 bytes of bit addressable memory* are found in the last 128-byte page of the EEPROM address space and represent the first 64 bytes of this page.

"OTP Memory: *The 64 bytes of OTP* (one-time programmable) Memory are found in the last 128-byte page of the EEPROM address space and represent the last 64 bytes of this page.

"Cryptoprocessor: *The cryptoprocessor is a 16-bit crypto engine* dedicated to performing fast encryption or authentication functions. It is based on a parallel RISC architecture allowing most instructions to be performed in a single clock cycle. The crypto engine can run in parallel with a microcontroller. And internal 16 x 16 multiplier provides 32-bit results within one cycle. The cryptoprocessor runs on an internal clock while the ROM stores the program code containing the following catalogue of functions: (1) Reset and self test, (2) Random number generation, (3) Exponentiation with CRT (241 to 1024) and without CRT (241 to 1024).

"RAM Memory Sharing: *The cryptoprocessor and the AVR* share the RAM memory as follows: When the cryptoprocessor is inactive, the entire RAM can be accessed by the CPU. When the cryptoprocessor is active, the shared RAM is not accessible.

"Operational Modes: *The chip features two operational modes.* (1) A supervisor mode with a privileged access to datas, active when code is executed from the supervisor memory; (2) A user mode with data access restrictions, active when code is executed from EEPROM user memory.

"*The supervisor and user locations are programmed* in I/O registers. In user mode, direct read and write access to I/O registers and EEPROM is not allowed. Furthermore, a programmable zone in the RAM can be reserved for supervisor mode. Any attempt to access the I/O, EEPROM or reserved RAM area generates a maskable interrupt. Also, a jump to the supervisor zone in user mode generates a non-maskable security interrupt. The chip provides a supervisor call instruction to branch at a defined vector address of the supervisor zone.

"*This powerful hardware section is specially designed* to ensure full separation between applications. It provides secure protection against program dumping and secure data access control."

The essence in this much abbreviated look at Atmel security is simply this: Anyone attempting to go around security barriers will be blocked and permanent (irreversible except at the factory) stops can be instituted. 'Interrupt' is the code for attempts to 'hack' the contents.

"Security Features: *For security reasons, the following list is not exhaustive.* (1) Shipping and initialisation are protected by a Transport Code; (2) Power down/up protection; (3) Low-frequency protection against static analysis;, (4) High-frequency protection against intrusion; (5) Unique serial number; (6) Supervisor mode; (7) Secured test structure; (8) Logical scrambling and (9) Secure layout."

One explanatory example here - the chips are being prepared for shipment to the ultimate customer. Mistakes could happen during transit - someone could hijack the shipment. Before the chips are shipped, a "Transport Code" is entered into each to prevent the chips being useful when received until each chip is 'neutralised' (extracting the in-transit protection transport code).

"ISO 7816 I/O Ports: *The ISO 7816 I/O pins are controlled by the CPU.* They can be configured to generate an interrupt on: (1) Low level, (2) Positive edge, (3) Negative edge, (4) Positive or negative (switching) edge.

"Interrupt controller: *The chip has a total of six* interrupt vectors: (1) security, (2-3) I/O pins 0 and 1, (4) timer, (5) EEPROM end of write cycle, and (6) cryptoprocessor interrupt.

"*Each of these interrupt sources can be individually enabled* or disabled by setting or clearing a bit in the Interrupt Mask Register located in the I/O memory space. This register also contains a global disable bit which disables all interrupts at once. One priority level can be programmed in the Interrupt Priority Register. A second priority level is given by the vector number. The interrupt controller is able to memorise interrupts. It sends them to the microcontroller in the correct order according to their priority level."

SatFACTS Pacific/Asian MPEG-2 Digital Watch: 15 August, 2007

Bird	Service	RF/IF &Polarity	# Program Channels	FEC	Msym	Receivers and Errata
Thcm5/78.5	SkyChAust	3695/1455H	up to 3	3/4	5(.000)	CA (#1, 3); FTA audio #2
	ANT Greece	3672/1478H	1 TV	3/4	13(.333)	Late July 04: room for more (FTA)
	TARBS ME mux	3640/1510H	12TV, 12 radio	2/3	28(.066)	CA + 23FTA(A1TV, IRB3, Visjon Norge,Pakistan)
	Ch Nepal	3626/1524V	1	3/4	15(.556)	New 03/03; FTA
	Mahar mux	3600/1550H	11TV, 1 rad	3/4	26(.667)	Thai + Indian services; FTA inc. Vibe TV, Sindh TV
	RR Sat mux	3551/1600H	8TV,10 radio	3/4	13(.333)	3TV, 5radio inc. Hellas TV Greece FTA
	TVK Cambodia	3448/1702H	1TV	1/2	6(.312)	**FTA**
	TARBS/Th5	3480/1670H	12 TV+radio	2/3	26(.667)	**3FTA**: TV5, VTV4, ATN Bangla
	Thai Global	3425/1725V	up to 7?	2/3	27(.500)	FTA (reaches SE Australia)
InSat 2E/83	**ETV mux**	4005/1145V	6+ TV	3/4	27(.000)	Several ETV now here; wide beam
-	**Hyd Dig 2E**	3910/1240V	1	3/4	5(.000)	SCPC, OK E. Aust. wide beam
	Kairali TV	3699/1451V	1	3/4	3(.184)	SCPC, OK E. Aust wide beam
	Indian mux	3643/1507V	3	3/4	19(.531)	corrections 12/02
	Sky Bangla	3430/1720V	1TV	3/4	6(.000)	New - November 2002
NSS6/95E	Ant Pac (Greek)	11.104H-Australia	1 TV	3/4	2(.800)	Now CA; was 11.083H
As2/100.5E	**Guangdong TV**	4075/1075H	1TV + radio	3/4	6(.000)	July 04: FTA
	Euro Bouqt	4000/1150H	5TV, 19 radio	3/4	28(.125)	FTA TV + radio; Russia,Port,Spain, Italy/Euro Bqr
	SatLink	3960/1190H	3TV	3/4	27(.500)	(Real Madrid left July 2007)
	Reuters News	3905/1245H	1TV	3/4	4(.000)	Was 3923H; sometimes **FTA**
	WorldNet	3880/1270H	4+/18radio	1/2	20(.400)	FTA; multiple audio services V2360, A2320
	APTN Asia	3799/1351H	1	3/4	5(.632)	Sometimes **FTA**; also 3895Vt
	Reuters/Sing.	3775/1375H	1	3/4	5(.631)	**FTA** & CA
	Macau MUX	4148/1002V	5TV	3/4	11(.850)	5 chs TV, FTA, some tests
	Dubai MUX	4020/1430V	4+, radio	3/4	27(.500)	FTA ; Dubai Sports Ch some English, soccer
	Russian/Israel	3832/1318V	up to 4 video	3/4	7(.271)	Two Israel, two Russian (REN-TV)
	ArabSat#2	3820/1330V	8+ video?	3/4	27.5	New 07-06; 10 FTA here
	Trace TV	3792/1358V	1	3/4	2(.400)	new here Dec 2004; Euro-French music videos
	BYU-TV	3767/1383V	1 + 20 audio	1/2	6(.530)	Increased coverage; great variety audio chs(03-05)
	3-ch miniMUX	3752/1398V	up to 3	3/4	5(.640)	Sun-TV, Surya TV, KTV (FTA)
	Saudi TV1	3660/1490V	7+/tests	3/4	27(.500)	FTA MCPC; Yemen, MBC EUROsport tests
Express2/103E	**Various-tests**	3675/1475R	2	3/4	4(.340)	Now loaded from 96.5E; svrl below 3900 all RHC
As3S/105E	**Chinese regionals**	3671/1471V	2	3/4	8(.932)	New 07-06; Yanbian, Jilin Satellite TV
	CETV digital	3680/1470H	1+ TV	3/4	26(.670)	replaces analogue same freq; V33, A32
	Zee bouquet	3700/1450V	10TV	3/4	27(.500)	Now SECA 2 CA (10-04); Radio Aust. Eng. A2011
	Ch News Asia	3706/1444H	1TV (+)	3/4	6(.000)	English + V1160, A1120; 525, 625 versions
	Azio TV	3716/1434H	1TV (+)	3/4	7(.000)	Was parallel to 3640Hz analogue (now gone)
	BTV World	3725/1425V	1TV	3/4	4(.450)	
	TVB 8	3729/1421H	1TV	3/4	13(.650)	
	Zee Movies	3732/1418V	3TV	3/4	6(.500)	Conax CA, all Hindi films
	TV One	3739/1411V	1TV	3/4	2(.8934	Also reported 3.333, ¾ October 2005
	SAB TV	3743/2407V	1TV	3/4	3(.300)	SAB may no longer here here; moved to NSS-6?
	Fashion TV	3747/1403V	1TV	3/4	2(.625)	new frequency October 2005
	AAJ-TV	3750/1400V	1TV	3/4	2(.820)	New April 2005; English, urdu
	Arirang TV	3755/1395V	1	7/8	4(.418)	FTA SCPC; New PIDs V3601, A3606 June 2003
	Now TV +	3760/1390H	up to 10TV	7/8	26(.000)	CA + 10 **FTA**; DW, TV5; Al Jazeera English
	Star TV	3780/1370V	7(+)TV	3/4	28(.100)	NDS CA (Pace DVS211, Zenith)
	GXTV	3806/1344V	1TV + 3 radio	3/4	4(.420)	Guangxi TV; was As2
	Shaanxi TV	3813/1337V	1TV + 2 radio	3/4	4(.420)	Was As2
	Anhui TV	3820/1330V	1TV + 2 radio	3/4	4(.420)	Was As2
	Jiangsu TV	3827/1330V	1TV + 2 radio	3/4	4(.420)	Was As2
	HLITV	3834/1316V	1TV	3/4	4(.420)	Was As2; HeiLong
	Star TV	3840/1310H	7(+) TV	7/8	26(.850)	NDS CA (Pace DVS211, Zenith)
	Star TV	3860/1290V	5(+)TV	3/4	27(500)	NDS CA (Pace DVS211, Zenith)
	Dragon TV	3886/1264V	1 TV	3/4	4(.800)	Shanghai
	Shaandong	3895/1255V	1TV + 6 radio	3/4	6(.813)	Apparently Mongolia
	CCTV1	3904/1246V	1TV, 1 radio	7/8	4(.420)	
	Jilin TV	3914/1236V	1TV + 2 radio	3/4	4(.420)	
	Star TV	3920/1230H	4+ TV	7/8	26(.850)	
	CNNI	3960/1190H	8TV, 1 radio	3/4	27(500)	PowVu CA; new SR Apr 29; CNN radio **FTA**
	StarTV	3980/1170V	6+TV	3/4	28(.100)	NDS CA; Star News India **FTA** VPID 514, APID 648
	Star TV	4000/1150H	8(+)TV	7/8	26(.850)	NDS CA w/ **4(Chinese) FTA**
	Sahara digital	4020/1130V	8TV, 1 radio	3/4	27(.250)	New Sr September 2004
	Hubei TV	4035/1115H	1TV + 2 radio	3/4	4(.420)	Was As2
	Tianjin TV	4046/1104V	1TV + 2 radio	3/4	5(.950)	new December 2004
	Sichuan TV	4051/1099H	1TV + 1 radio	3/4	4(.420)	Was As2
	Qinghai TV	4067/1083H	1TV + 2 radio	3/4	4(.420)	Was As2
	Hunan TV	4082/1068H	1TV + 1 radio	3/4	4(.420)	Was As2
	Fashion/HK-Asia	4088/1062H	1TV	3/4	2(.626)	New July 2005
	Pakistani TV	4091/1059V	4TV, 1 radio	3/4	9(.330)	new Sr, channels, April 2006
	Sun TV	4095/1055H	1	3/4	5(.554)	"History Channel" - SCPC, some English
	PTV National	4106//1044V	1TV, 1 radio	3/4	3(.333)	
	TVB8 Mux	4111/1040H	4 TV	3/4	13(.650)	MATV Ch Movies now Irdeto 1
	Indus News	4115/1035V	1	3/4	3(.331)	Hindi (+ "Plus"); day parts
	CCTV bqt	4129/1021H	4 TV, 4 radio	3/4	13(.240)	moved from 4115
	Zee Bqt #2	4140/1010V	8(+) TV	3/4	27(.500)	Now SECA 2 CA (10-04); 1 occ. FTA (varies)
	Henan TV	4166/984V	1TV + 8 radio	3/4	4(.420)	Was As2
	Fujian TV	4180/970V	1TV + 2 radio	3/4	4(.420)	Was As2
	Jiangxi TV	4187/963V	1TV + 2 radio	3/4	4(.420)	Was As2
	Liaoning TV	4194/956V	1TV + 2 radio	3/4	4(.420)	Was As2
Cak1/107.5	Indovision (S-band)	2.535, 2.565, 2.595, 2.625, 2.655	33(+) TV	7/8	20(.000)	NDS CA using RCA/Thomson, Pace IRDs; **2.535 has 2 FTA.** Bird now inclined.
T'Kom/108E	**IndoBqt**	3460/1690H	up to 6	3/4	28(.000)	also 3586H/17.500, 3496H/19.615
C2M/113E	**TPI**	4185/965V	1	3/4	6(.700)	FTA SCPA; NT/NC only
	Anteve	4144/1006V	1	3/4	6(.510)	change from 4055V; FTA SCPC
	Kabelvision Mux	4080/1070H	7+ TV	7/8	28(.125)	also try 3500H, 27.000, 3/4; strong NZ
	Indostar	4074/1076V	1	3/4	6(.500)	New (but probably temporary) 07-06
	SCTV	3934/1216H	1	3/4	6(.620)	**FTA,** may not be active full time
	Indo MUX	3880/1270H	3+ TV	7/8	28(.121)	**FTA;** Sr change 01/03; erratic
	TVRI	3765/1385H	1TV	3/4	5(.555)	bounces btwn FTA and CA; unreliable (12-04)

Bird	Service	RF/IF & Polarity	# Program Channels	FEC	Msym	Receivers and Errata
	SCTV	3726/1424V	1TV	3/4	6(.620)	was on 4048V; New Caledonia, parts of Australia
	RCTI	3473/1677H	2	3/4	8(.000)	FTA SCPC;or, 3774H, 6.520, ¾ (June 06)
C6B/115	**See**	SF#156	p. 29	for interim	update	Services/bird new August 1, 2007
As4/122E	**CCTV MCPC**	3820/1330V	8	3/4	27(.500)	also: 3820V, 3940V,4100Vin blindscan
	WIN, ABC	12.636V	2			New Aug 07; SA CA
Sin3/125	**Tests**	3989/1161H	1	3/4	9(073)	Tests, coverage boresight still unknown Aug 2007
Jc3/128	Miracle Net	3996/1154V	3 up to 6	5/6	22(.000)	PowerVu; some FTA (Ch. 1 & 3)
	Asian bqt	3960/1190V	up to 8	7/8	30(.000)	CA & **FTA** NTSC: Japan, Taiwan
Ap6134E	Multiple	4140/1010V	up to 8	7/8	27(.500)	scan 3500-4200 V+H; analogue 3860V
T18/138	**Tests**	3460/1690V	8	3/4	30(.000)	also try 3660/3540VVt, Sr 30.000, 3/4; some FTA
Am3/140	**STS +**	3731/1419R	1	3/4	3(.200)	North beam; also try 3875R, 12.475, 1/2
Jc2A 154	**BYU-TV**	3915/1245V	1+ 20 languages	3/4	4(.166) (?)	Strong NZ & Australia; may now be 1/2, 6.525
MeasSs2	**Astro Mux**	11.602H	up to 17TV	3/4	41(.500)	Aust East beam - **3 FTA** + 14 CA
B3/152	**7 Cent. Feed**	12.310H	1TV	3/4	5(.100)	Was B1; moved June 2006, concerns B1 failures
	AuroraBiz	12.407V	4 TV, 10 radio	2/3	30(.000)	differs from 12.407 C1; **tune ch FTA; NZ+Au**
	UBI	12.425V	up to 13 TV + radio	3/4	22(.500)	Now Irdeto V2
	Globecast 2	12.525V	13 TV, 8 radio	2/3	30(.000)	NZ + Au, FTA + Mcrypt CA
	Globecast (feeds)	12.550-.555V	1TV	¾ & 2/3	6(.110/.670)	occ feeds, NZ + Au; recently 12.553V
	Globecast	12.564V/T13	2+ TV	2/3	30(.000)	AMTV, Healing only FTA svcs now here
	UBI	12.613H/T14L	11+TV	3/4	22(.500)	High performance beam; not NZ; new CA 07-06
	UBI	12.640H/T14U	11+TV	3/4	22(.500)	High performance beam; not NZ; new CA 07-06
	Globecast 1	12.658V/T7	14TV, 15 radio	2/3	30(.000)	NZ + Au (Mcrypt, PowVu capable)
	UBI	12.674H/T15L	11+TV	3/4	22(.500)	High performancebeam; not NZ; new CA 07-06
	UBI	12.701H/T15U	11+TV	3/4	22(.500)	High performance beam; not NZ; new CA 07-06
	WA ABC	12.702V	1 TV, 1 radio	7/8	14(.288)	ABC WA tests, FTA
	WA SBS	12.720V	4TV, 2 radio	5/6	12(.600)	SBS, radio tests WA FTA
	WA GWN/WIN	12.738V	2TV	7/8	14(.295)	Irdeto V2 CA, tests (GWN, WIN)
C1/156E	Aurora	12.324V/T1U				not currently in use
	Pay TV	12.365V/T2	11TV, 2 radio	3/4	27(.800)	Tests; SBS-NDS CA, others FTA when here
	Aurora Home	12.407V/T3	5 TV, 13 radio	2/3	30(.000)	NZ (90cm) + Australia **(Only C1 svc left on NZ)**
	Pay-TV	12.447V/T4	5TV, 4 data	3/4	27(.800)	Australia NA only (leakage to Norfolk, New Cal)
	Pay TV	12.487V/T5	3+ TV, data	3/4	27(.800)	Australia NA only (leakage); 9-Net x 3 widescreen
	Aurora 2	12.527V/T6	7TV, 20 radio	3/4	30(.000)	Arrow radio (still here), tone FTA
	Pay-TV	12.567V/T7	10 TV	3/4	27(.800)	Pay-per-view movies; CA
	Pay-TV	12.607V/T8	10 TV	3/4	27(.800)	Pay-per-view movies; CA
	Pay-TV	12.647V/T9	10 TV	3/4	27(.800)	Pay-per-view movies; CA
	Pay-TV	12.692V/T10L	6TV, 27 radio	1/2	28(.650)	ABC for Foxtel/Austar; previously 12.288V
	Aurora MUX	12.728V/T10U	4TV, 17 radio	1/2	24(.450)	changes September 2005
	Austar	12.305H/T11	6TV, 24 data	3/4	30(.000)	Austar inter; **Expo FTA**
	Pay-TV	12.358H/T12	10 TV	3/4	27(.800)	NDS CA + Mcrypt; CA
	Pay-TV	12.398H/T13	10 TV	3/4	27(.800)	CA, subscriptions available Australia, Norfolk
	Pay-TV	12.438H/T14	6TV, 3 data	3/4	27(.800)	Sky News active; 'Help x 2' **FTA**
	Pay-TV	12.478H/T15	10 TV	3/4	27(.800)	CA, subscriptions avail Au, Nrflk; **TVSN FTA**
	Pay-TV	12.518H/T16	10 TV	3/4	27(.800)	CA, subscriptions available Australia, Norfolk
	Pay-TV	12.558H/T17	10 TV	3/4	27(.800)	"Home"CA, subscription available Australia, Nrflk
	Pay TV	12.598H/T18	10 TV	3/4	27(.800)	CA, subscriptions available Australia, Norfolk
	Pay-TV	12.638H/T19	10TV, 30 radio	3/4	27(.800)	CA, subscription available Australia, Norfolk
	Pay TV	12.688H/T20	11TV	3/4	27(.800)	CA, subscription available Australia, Norfolk
D1/160E	Sky NZ test	12.394V	TV +	3/4	22(.500)	+ 12.421V, Au + NZ beam
	SBS SE	12.451H	TV+	5/6	12(.600)	+12.469H/Qld, 12.487H/South,
	Sky NZ test	12.519V	TV+	3/4	22(500)	+12.546 NZ only
	Sky NZ	12.581H	TV+	3/4	22(.500)	+12.608, 644, 671, 707, 734H NZ only (Aug 2007)
	ABC NSW	12.514H	TV	7/8	14(.294)	Australia only
	ABC South	12.532H	TV	7/8	14(.294)	Australia only
	ABC Northern	12.550H	TV	7/8	14(.294)	Australia only
	ABC Western	12.577H	TV	7/8	14(.294)	Australia only
	ABC Victoria	12.595H	TV	7/8	14(.294)	Australia only
	ABC Qld	12.613H	TV	7/8	14(.294)	Australia only
	Southern Cross	12.744V	TV + 1 radio	3/4	5(.100)	Australia only
I8/166E	SelecTV	12.526H	8+TV	3/4	28(.800)	& 12.286, 12.326
	CCTV	12.557H	3+TV	3/4	13(.240)	**FTA**-Australia
	ABS-CBN	12.575H	4+TV, 4+ radio	2/3	13(.845)	CA -Australia
	MYSAT	12.646H	up to 8 TV	3/4	28(.066)	FTA V=5340, A=790 -Australia
	JEDI/TVB	12.686H	11+ TV	3/4	28(.126)	June 2002-Irdeto-2 CA - Australia
	PnGlobal Aust	12.726H	6+TV	3/4	28.(066)	Some **FTA**-Australia
	ABC A-P	4180/970H	2TV, 2 radio	3/4	27(.500)	Dateline west; also east PAS2, 3901V
	Hallmark Asia	4166/984H	1 TV	3/4	6(.620)	Temporary FTA (January 2007)
	Disney Pac	4140/1010H	typ 6 TV	5/6	28(.125)	PowVu CA
	Hwazen TV	4130/1020H	1 TV			
	NHK Joho	4060/1090H	7TV, 1 radio	1/2	16(.180)	PowVu CA & **FTA**; sub available-changes 05-06
	FOX Mux	4040/1110V	up to 5TV	7/8	26(.470)	was PAS-2, previously 3992Vt; **feeds FTA**
	NET +	4121/1029V	1 TV	3/4	4(.774)	NET25 + FTA; new PIDS April '03; reload
	ESPN USA	4020/1130H	8+TV, data	3/4	26(.470)	PowVu CA; ch 11 DCP-CCP bootload; audio **FTA**
	Discovery	3980/1170H	8 typ.	3/4	27(.690)	PowVu/CA (some audio **FTA**)
	CalBqt/Pas8	3940/1210H	up to 3+ FTA	7/8	27(.690)	PowVu CA & **FTA (EWTN + CBS +TBN +)**
	CNBC HK	3900/1250H	up to 7TV	3/4	27(.500)	NDS CA (6 channels); one test card occ FTA
	FilipinoMUX	3880/1270V	up to 8TV+radio	5/6	28(.694)	**Myx FTA** V1960, A1920 + radio FTA
	CCTV Mux	3829/1321H	up to 4 + 1 radio	3/4	13(.240)	PowVu FTA, replaces PAS-2 svc
	TVBS-N	3836/1314V	**1FTA**, 4+ CA	3/4	17(.500)	CCTV cross pole; new SR 04-06
	EMTV PNG	3808/1342V	1 + 2 radio	3/4	5(.632)	PowVu CA
	CNNI	3780/1370H	3, up to 5 TV	3/4	25(.000)	PowerVu; some audio **FTA**
	Discovery Asia	3764/1386V	Up to 6 TV	3/4	19(.850)	PowerVu; Asian MUX; new parameters Nov '03
	MTV	3740/1410H	8	2/3	27(.500)	# 8 **MTV China FTA V289, A290;** rest CA
I2/169E	WA Mux Pv	12.281V	3+ TV, radio	2/3	27(.500)	PowVu CA, WIN, ABC NT, SBS; status unknown
	Ariang TV	12.401V	1TV	3/4	4(.400)	Test - may not stay permanently
	ABS-CBN	12.575H	4TV, 2 radio		13(.845)	Temp **FTA**; subs Aust 011-800-2270-0722
	Test mux	12.715H	6+ TV	2/3	30(.000)	initially with 6 NTSC colour bars
	TARBS feeds	4090V/1060V	9TV + radio	3/4	21(.000)	Occ **FTA** (Chile +); BIG power reduction Nov 03
	BBC SCPC	3986/1164H	1TV	1/2	5(.700)	BBC World moved here January 2005
	Middle East	3836/1314V	4 typ	3/4	13(.331)	Subscriptions available; Strong Technology

skybridge

Skybridge (Australia) a merger of Ursys and GM Communications www.skybridge.com.au

Installers wanted for satellite broadband connections

The Australian Government's Australian Broadband Guarantee Subsidy has provided for unprecedented activity in the two way satellite installation industry. Skybridge is a major provider of installation services for ISP's in Australia and we are seeking contract installers to help us with the increased demand Australia wide.

ipstar Broadband Satellite

This is a great opportunity to compliment your existing business with the provision of installation services of this exciting new technology. If you have experience in installing receive only satellite systems, Skybridge will provide all of the necessary training documentation and technical support you will require to be proficient in installing IPSTAR satellite broadband.

If you would like to be involved please register your interest @ installers@skybridge.com.au

Bird	Service	RF/IF & Polarity	# Program Channels	FEC	Msym	Receivers and Errata
(PAS2/169E)	**Adventists.tv**	4040/1010H	1	2/3	5(.900)	New December 2003; 24/7 "Hope Chs."
	Feeds	3868/1182H	1	2/3	6(.620)	FTA (occ sport); also try 3863,Sr6.100
	Feeds	3939/1211H	2 (typ NTSC)	2/3	6(.620)/7(.498)	FTA-typ NTSC-occ sport, live Shuttle
	Cal PowVu	3901/1249H	up to 8	3/4	30(.800)	PowVu CA + **FTA**(includes BBC-W 05-05)
	HK bouquet	3850/1300H	up to 8	2/3	24(.900)	was 4148Vt; some **FTA**
	Korean Bqt	3771/1379H	1	3/4	6(.510)	Korean MUX, reload 12-04; new Sr
AMC23/172E	**Various-tests**	12.730H	up to 8	3/4	30(.000)	Testing on NZ/East Australia beam
I804/174E	**iPSTAR**	12.619H	1	2/3	25(.220)	Tests, late May start; also 12.646H
	Tests-NZ beam	12.646H	1	3/4	22(.418)	Testing possible data links; June 2003
	RFO Poly	4027/1123R	1TV	3/4	4(.566)	SE spot beam; was 4027LHC
I701/180E	TNTV	11.060&11.514V	9	3/4	30(.000)	east spot; 10TV + r each, vertical pol.
	TVRFO	11.136V, 11.174V	6+TV, 3+ radio	3/4	23(.149)	**FTA** 11.136 Tahitian beam, 11.174 west beam; 12/04
	Canal+Sat	11.610H	16TV, 1 radio	3/4	30(.000)	1+ **FTA**, MediaGd "2"; + 10.975 weaker
	PBS	12.648HH	16TV possible	3/4	28(.066)	Testing Fiji region pay-TV (MDS) package (Oct '04)
	TVNZ/BBC	4186/964RHC	1	3/4	5(.632)	DMV/NTL early vers. occ feeds, typ ca
	TVNZ	4178/972RHC	1	3/4	5(.632)	DMV/NTL early vers., occ feeds, typ ca
	AFRTS DTS	4175/975L	3 TV, 3 radio	2/3	3(.680)	'DTS Direct to Sailors; audio previously FTA - gone
	TVNZ/Aptn	4170/980RHC	1	3/4	5(.632)	DMV/NTL early vers. occ feeds, typically ca
	Fiji Sky Pacific	4095/1055LHC	6TV + future radio	3/4	16(.505)	Nagravision CA (Feb 1, 2005) New PIDS
	Fiji Sky Pacific	4055/1095LHC	7TV + future radio	3/4	16(.505)	All now (including Fiji 1) CA; 7 Feb, 2005)
	TVNZ/feeds	4052/1098RHC	1	3/4	5(.632)	DMV/NTL early vers.,occ feeds, typ ca
	TVNZ feeds	4044/1106R	1	3/4	5(.632)	SCPC, mixed CA and **FTA** feeds
	NBC to 7 Oz	3960/1190R	1	7/8	6(.447)	CA, Leitch encoded
	TBN Mux	3927/1223R	4TV	2/3	11.(394)	January 2006-now 4 channels, new Sr
	WorldNet	3886/1264R	1TV, 37 radio	3/4	25(.000)	New PIDs Dec 03 very strong NZ, Pacific
	Ioarana	3772/1378L	1	3/4	4(.566)	FTA SCPC; East Hemi Beam-Tahiti
	NASA TV	3854/1296R	1 TV	3/4	2(.000)	24/7 live NASA - West Hemi bm (can be difficult!)
	TVNZ	3846/1304R	1	3/4	5(.632)	SCPC, mixed CA & **FTA**, feeds
	USA feeds	3749/1401R	4?	?	26(.400)	16-QAM (not MPEG-2 compatible)
NSS-5/177W	Pacific IP Data	3763/1387R	none-data	3/4	27(.500)	Data only but useful for dish alignment
	RFO/Tempo	3920/1230R	1	3/4	2(893)	Wallis & Futuna Island(s) service
	Wallis/Futuna	3922/1228L	1		2(.895)	Outward bound W & F
	BYU-TV	4185/965R	1TV, 20+ audio	1/2	6(.525)	Global beam - requires sizeable dish
	Australia Temp.	12.522V	8 SCPC	7/8 & 5/6	14.294 & 12.600	Aust beam: 12.522, 538,555,574,604,621,639 & 657
	iPSTAR Tests	12.691V	8 TV	5/6	17(.600)	CA Tests - Taiwan TV; data coming?? (NZ beam)

MPEG-2 DVB Receivers: (Data here believed accurate; we assume no responsibility for correctness!)

AV-COMM R3100. FTA, excellent sensitivity (review SF May 1998); new version Sept. '99. AV-COMM P/L, 61-2-9939-4377.
AV-COMM Tiny Tot. FTA, 12Vdc operated, palm sized, low power consumption; review SF#120. Contact # above.
Coship 3188C. Review SF#107. Blind search FTA rcvr; works well. Phoenix Technology Group (www.phoenixsatellite.com.au) (Irdeto 2 as well as FTA versions)
Coship FTA, CA, HDD. Review SF#143, state of art functions, blind search. Phoenix (above), Satlink NZ, fax 64-9-814-9447;
Divitone: "Left-handed" review SF#115; does "code key" entry. Available http://www.satmax.ws
eMTech eM-100B (FTA), eM-200B (FTA + CIx2), eM210B (FTA + 2xCI + positioner); KanSat 61-7-5484 6246 (review SF#89)
eM-150/Homecast. FTA + embedded multi-format, review SF#144. Sciteq (61-8-9409-6677) and Kristal (61-7-4728 7704)
Fortec Star Lifetime. Two versions, both blind search, code-key programmable, one X 2 CI. Review SF#119. www.aDigitaLife.com
Homecast (em-150, eM-1150, eM-2150) series of FTA, CA, HDD sate of art STBs, review SF#144. Sciteq (www.sciteq.com.au)
Humax ICRI 5400 (Z). Embedded Irdeto + 2 CAM slots; initial units had NTSC glitch, now fixed. Widely available; new software avail 04-04, SF#76.
Humax IRCI 5410 (Z). Adaptable version capable of holding multi-CA systems (SF#98, 99). Widely available; original importer Sciteq (www.sciteq.com.au).
Hyundai-TV/COM. HSS100B/G (Pacific), HSS-100C (China) FTA. Different software versions; 2.26/2.27 good performers, 3.11 and those with Nokia tuners also good; later 5.0 not good.
Hyundai HSS700. FTA, PowerVu, SCPC/MCPC. Review SF March 1999. Kristal Electronics, 61-7-4788-8902.
Hyundai HSS800CI. FTA, Irdeto (with CAM) + other CA systems, PowerVu, NTSC. Kristal Electronics, above; review SF#63.
INNOVIA IDS3088. Review SF#111. Blind search FTA receiver. High quality IRD; available Phoenix TechnologyGroup, and Satmax (http://www.satmax.ws).
ID Digital CI-24 Sensor. New August 2003; new lower noise tuner, extra sensitivity; CI Interface slot Irdeto 1 & 2; review SF#109. Sciteq 61-8-9409-6677.
KSF-570 FTA digital receiver, import; KSC-570 adds CI x 2 (no test or user results available). Asoft Limited, 64-4-234-1096
KSC-N550H2 'Premium Dual DVR' digital receiver (no test or user results available). Asoft Limited, 64 4 234 1096
MediaStar D7.5. New (May 00) single chip FTA; review June 2000 SF. MediaStar Comm. Int. 61-2-9618-5777 (www.mediastar.com.au)
MediaStar D10. FTA and Irdeto embedded CA. VG receiver; see review SF#96, August 2002. Contacts immediately above.
MultiChoice (UEC) 660. Essentially same as Australian 660, not grey market contrary to reports. Sciteq tel 61-8-9306-3738
Nokia "d-box" (V1.7X). European, FTA, may only be German language, capable of Dr. Overflow software. SF#95, p. 14.
Nokia 9200/9500. When equipped with proper software, does Aurora, originally did pay-TV services provided software has been "patched" with "Sandra" or similar program. See SF#95, p. 14, SF#96 p. 15. SatWorld 61-3-9773-9270 (www.satworld.com.au)
Pace DGT400/DVR500. Originally Galaxy (Now Foxtel+Austar). Irdeto, some FTA with difficulty (Foxtel Australia 1300-360818). UECs replaced.
Pace "Worldbox" (DSR-620 in NZ). Non-DVB compliant NDS CA including Sky NZ, no FTA; similar "Zenith" version (see SF#115, p. 15).
Phoenix 111, 222, 333 models (no longer produced): Service, backup - Phoenix Technology Group 61 3 9553 3399; www.phoenixsatellite.com.au
Pioneer TS4. Mediaguard CA (no FTA), embedded Msym, FEC, only for Canal+Satellite (AntenneCal ++687-43.81.56)
PowerVu (D9223, 9225, 9234). Non-DVB compliant MPEG-2 unless loaded with software through ESPN Boot Loader (see below). Primarily sold for proprietary CA (NHK, CMT etc). For service only - call Scientific Atlanta 61-2-9452-3388. For revision model D9850, see Scientific Atlanta (below).
Prosat 2102S. FTA SCPC/MCPC, NTSC/PAL, SCART + RCA. Sciteq 61-8-9306-3738.
SatCruiser DSR-101. FTA SCPC/MCPC, PowVu, NTSC/PAL. (Skyvision Australia 61-3-9888-7491, Telsat 64-6-356-2749); no longer available.)
SatCruiser DSR-201P. FTA SCPC/MCPC, PowVu, NTSC/PAL, analogue, positioner - (Skyvision - see above); no longer available.
SATWORK ST3618. Blind search FTA receiver. Fast search, problems, especially in "memory-filing" system; review SF#111. Available DMSi at tim@dmsiusa.com.
SATWORK ST3688. Blind search, 3000+ ch memory, multi-format RF modulator; improved version 3618. Review SF#113; available DMSi (above).
Scientific Atlanta D9223, D9234, D9225; Orig. PowerVu, superceded Dec 2003 by D9850. Commercial receiver, available TVO 61-2-9281-4481, John Martin
Strong Technologies SRT2620. SCPC, MCPC FTA, exc sensitivity, ease use, programming. Review SF#91 (ph. below).
Strong SRT 4600. SCPC, MCPC, PowerVu; exc graphics, ease of use, review SF#64. Strong Technologies 61-3-8795-7990.
Strong SRT 4654X, New mid 2007, Conax + Irdeto CA; review SF#156. Receiver is state of art, above average sensitivity. Strong Technologies 61-3-8795-7990.
Strong 4800. SCPC, MCPC, embedded Irdeto+ CAM slots, does code-key with additional software, Aurora. Strong Technologies 61-3-8795-7990.
Strong 4800 II. SCPC, MCPC CAM slots x 2 for Aurora +, Zee, Canal +, code key with additional software. Strong Technologies (above); review SF#103.
Strong 4890. SCPC, MCPC, 30Gb PVR, 2 CAM slots, DiSEqC 1.0, 1.2 (review SF#84), does code key with additional software; Strong Technologies, # above.
UEC Atlas/Titan (1000). New July 2003, replacing DGT400 for Austar. No SCART, L-band loop; also available Rural Electronics 61-2-6361 3636.
UEC642. Designed for Aurora (Irdeto), approved by Optus; w/new software, C-band FTA; faulty P/S. Norsat 61-8-9451-8300.
UEC660. Upgraded UEC642, used by Sky Racing Aust., Foxtel,limited FTA. (Nationwide - 61-7-3252-2947); P/S problems.
UEC700/720. Single chip Irdeto built-in design for Foxtel; unfriendly for FTA. Power supply problems, seldom sold to consumers; propensity to fall off back of trucks.
"X" Digital. When modified with "aftermarket" Internet softwre, does Aurora and other V-1 CA without card; review SF#119. Strong Technologies (61-3-8795-7990).
Zinwell ZMX-7500. Approved NZ Freeview, through authorised dealers; review SF#150; some unresolved technical issues as of June 2007.

Accessories:

Aurora smart cards. MCRYPT (Irdeto V2) cards now available (Jan 2005), Sciteq 61-8-9409-6677.
PowerVu Software Upgrade: PAS-8, 4020/1130Hz, Sr 26.470, 3/4; pgm ch 11 and follow instructions (do not leave early!)
PowerVu (Pacific) **repair service**: Cable & Sat Svcs, Darius West, 61-2-9792-1421 (Email darius@cases.net.au)

WITH THE OBSERVERS

AT PRESS DEADLINE

Correction: MCPC for Iran's Press TV on B3 should be 12.563H, Sr 30.000, 2/3 (V=1960, A=1920). Al Jazeera English, C1 12.367V, Sr27.800, 3/4 FTA has two new CAs on same transponder (V=1071, A=1072 and V=1081, A=1082). In SF#157: Fiji/New Caledonia PBS/RFO reception in Auckland.

Satellite launches: BSAT3A scheduled **August 14** to 110E, 12 Ku transponders. **September 21**, some sources continue to forecast launch of Optus D2 (152E to replace B3); see D2 below.

AsiaSat 2/100.5E: "Real Madrid (soccer/English) has disappeared from 3960H mux." (**GJ**, NZ)

AsiaSat 4/122E: "Eastern Circulation Channel is new on 3820V, Sr 27.500, 3/4), FTA." (**PI**) "This one seems strange - Australian WIN-TV and ABC Northern have begun on 12.636V, CA. GWN/WIN have been on SA protected 12.738V for many years; B3." (**Garner**)

ChinaSat 6B/115.5E: "Hezan TV on 3854H, Sr 4.420, FTA." (AZ, WA) "3705 not good here on a 3m." (SVC) "Tinajin TV 3940V (Sr 5.950), FJ1 and 2 3706H (Sr 4.420), AHTV 3929V (Sr 8.840). (**Malcolm**, NSW) Editor's note: See material to right and transponder list p. 29.

Optus B3/152E: If - IF D2 does go to 152E, B3 is not out of work. B1 is still working- sort of - at 164E; last days for a tired player.

Optus C1/156E: "National Indigenous TV replaces Indigenous Community TV, 12.527V, FTA." (**Benny**)

Optus D1/160E: "Sky TV NZ created textbook near-perfect transition from old vertical to new horizontal transponders in the early hours of July 31, results to be proud of! Freeview has added two new 'reserved' program channels (12.483H), as 'Reserved 9' and 'Reserved 10' plus 2 test radio channels - total now 18TV and 4 radio on this platform." (**Brian**) (Editor's note: TV9, a new 18 hour per day family channel starting off with pre-schoolers at 6AM and ending with adults to midnight is scheduled for end of September start. Triangle Television launches 'Stratos' to the platform sometime October. This will not be Triangle's terrestrial service but rather one created specifically for Freeview; Ex BCL Kordia is somehow involved in financing this." (**Henry T**) "National Indigenous TV replaces Indigenous Community TV, 12.643H; FTA. (**Benny**)

Optus D2/152E: Some sources continue to list launch September 21 of D2 as replacement for B3 at 152E; other sources simply do not list a launch date for D2 while others say it will be D1R going to 160E allowing D1 now at 160 to move to 152, thereby replacing B3. Pick your own lotto number.

Sinosat 3/ 125E: "Try 3989H, Sr 9.073/FEC 3/4 with two program channels - reported NZ but no confirmation at presstime." (**CS**)

ChinaSat 6B-115.5E Activity

Chinese domestic television is spread over a wide swath of sky including: Apstar 2R (76.5E), Chinasat-1 (87.5E), AsiaSat 3S (105.5E), AsiaSat 4 (122E), Sinosat-1 (110.5), Sinosat 3 (125E) and Apstar 6 (134E). Now these government (CCTV) and independent telecasters (and radio broadcasters), who provide 152 television channels and 155 radio services will, as soon as early September, consolidate on a pair of new satellites: Chinasat 6B (115.5E) and Sino-3 at 125E. Parallel transmissions on their pre-change birds and transponders will continue until China Central Time midnight on 24 September. The programming affected involves CCTV, local (Chinese) terrestrial broadcasters, pay television.

There are several legal and economic reasons for this consolidation. Chinese government 'monitors' assigned the task of policing what is being broadcast will benefit by having just two satellites to monitor for compliance with national law (a number of terrestrial broadcasters have been cited for helping themselves to transmissions from foreign countries without the nicety of contracting for the programming rights). It is one (small) step towards China working within the framework of international copyright conventions in a country where the very latest Hollywood movies are often available on DVD at cut-rate prices weeks ahead of their commercial theatre release inside the USA. And with the World Olympics on the horizon, being 'squeaky clean' with other nations has taken on a new importance.

Chinasat 6B (115.5E) is widely reported throughout Australia on 2m and larger dishes; NZ typically 2.7 and upwards. Sinosat 3 (125E) appears far more elusive except in northern Australia. See Chinasat 6B pre-announced transponders p. 29, here.

Soapbox: "Now that www.austech.info seems sold to a Dutch media company (Orcom B.V., Amsterdam), it raises the issue of what one posts on a chat site, even if in complete innocence (or total stupidity). Remember THOIC - the UK operated site which was funded by Rupert Murdoch as a means of collecting identities for those who might be stupid enough to fall for a piracy scam?? Google Lee Gibling (602 hits) and pay attention to #1, 3 and 4 that come up. I quote from 'Murdoch Security Chief linked to anti-competitive actions'

WITH THE OBSERVERS: Reports of new programmers, changes in established programming sources are encouraged from readers throughout the Pacific and Asian regions. Information shared here is an important tool in our ever expanding satellite TV universe. **Photos of yourself, your equipment** or off-air photos taken from your TV screen **are welcomed**. TV screen photos: If PAL or SECAM, set camera to f3.5-f5 at 1/15th second with ASA 100 film; for NTSC, change shutter speed to 1/30th. Use no flash, set camera on tripod or hold steady. Alternately submit any VHS speed, format reception directly to SatFACTS and we will photograph for you. Deadline for September 15th issue: September 4th by mail or 5PM NZT September 5th if by fax to 64-9-406-1083 or Email skyking@clear.net.nz.

(Manchester Guardian); ' Evidence in the hands of the Guardian suggests that a former Scotland Yard commander who represents two of Rupert Murdoch's companies provided funds to a website that enabled counterfeiters to produce forged smart cards used to defraud ITV Digital, a principal rival in the Pay TV market. Ray Adams, who is head of security at NDS, a company controlled by Mr Murdoch's News Corporation, had a working relationship with the website, which has now been closed down and whose founder, Lee Gibling, has gone missing. According to emails in the possession of the Guardian, Mr Gibling was in contact with Mr Adams and received several thousand pounds from the NDS paid directly into his personal bank account.' This was in 2002. Google Ray Adams and be rewarded with 9,940,000 hits - the price one pays for having a 'common' name. There may be an even deadlier price - both Gibling and this particular Ray Adams have disappeared from planet Earth. Messing with smart card creators carries a very high element of personal risk. You have been warned." **(RMMD)** "British viewers can now select from over 400 hours of previous weeks programming using the 'iPlayer technology of web downloading. There are restrictions to the free service - (1) you must be in (or have) a UK based Internet address, (2) you cannot save permanent copies on the computer (they evaporate after a specified period of time). Try your luck at www.bbc.co.uk. Not to be outdone, Australia's ABC is now providing programming on 'TV Gateway': www.abc.net.au/tv." **(IF**, Qld). "Right card - wrong place. Mark Elsdon operating as Digisales in North Wales (UK) has been arrested for supplying authentic 'foreign smartcards' to pubs and others in his region. The genuine cards were sourced in European countries beyond the UK, allowing the users to view Premier League matches through foreign broadcasters rather than News Corp's BSkyB coverage. This is about economics - 'foreign cards' are sold on the basis of in-home viewing while BSkyB cards for pubs charge hundreds or thousands of pounds for the same coverage." **(DM)** "Broadband? How are we doing?? 72% of all American homes now have broadband of which 65% opt for the fastest (most expensive) version offered. There has been an increase of 21% in homes subscribing in year ending June 30. And in your neighbourhood???" **(Ted L.)** (Editor's note: A recent survey found 65% of those American homes with broadband 'co-consume' media at least once each day. 'Co-consume'? That means they watch television *while* surfing the web. This of course is only possible where broadband is widely available - and both NZ and Australia have a ways to go to catch up.) "More about the dollar costs for Triangle's STRATOS package scheduled to start Freeview in October. Non-commercial half hour programs can be broadcast for a charge between $292 and $495. What is a *commercial* program? Products directly promoted or promotion sending people to a web site. For commercial programs (with advertisements). fee is $1350 per half hour. Contact hans@tritv.co.nc or Gail 021 412 963." **(Adrian)** "Does EchoStar read SatFACTS? Seems strange that SF#153-154 included detailed report on status of piracy in North America (p. 27) pointing out a number of Asian built FTA receiver models are being sold in large quantity with after-sale mods possible to receive the Nagra CA 'protected' DISH Network programming. And then late in July EchoStar

Chinasat 6B/115.5E - transponder data

(courtesy Craig Sutton, others)

TRS1/**3706H (Fujian)**/Sr 4.420-3/4; TRS3A/**3750H**/ (HNSTV),Sr 10.490-3/4; TRS3B (CCTV 4,9)/**3771H**/ (CCTV 4,9,E,F)/Sr9.375-3/4; TRS5A/ **3786H**/ (SCTV), Sr5.440-3/4; TR5B/**3796H** (GZTV)/Sr6.930 -1/2; TRS5C/**3808H** (OTV6,SBN)/Sr8.800-3/4; TRS7/**3840H** (CCTV 1,2,7,10,11,12) /Sr27.500-3/4; TRS/**3880H** (CCTV3,5,6,8,HDTV)/Sr27.500-3/4; TRS15/**4000H** (CETV1)/Sr27.500 -3/4; TRS17/**4040H** /SR27.500-3/4; TRS19/**4080H**/ SR27.500-3/4;TRS21A/**4110H** (SITV)/SR13.300-3/4; TRS21B /**4129H**/SR13.300-2/3; TRS23A/**4147H** (Hubei)/SR6.150-3-4; TRS23B/**4158H**/SR8.680-3/4;TRS23C/**4171H**/ SR9.200-3/4.

...

TRSE10/**3600V**/ (TopDTV) SR27.500-7/8; TRSE12/**3640V**/ (TopDTV) SR27.500-3/4; TRS2/**3740V**/ (CMC) SR27.500-3/4; TRS4/ (Dongmai) **3769V**/SR9.260-3/4; TRS6A/**3807V**/ (Chongqing) SR6.000-3/4; TRS6B/**3825V**/ (ZJTV) SR6.780-3/4; TRS6C/**3834V**/ (SDSTV) SR5.400-3/4; TRS8A/**3846V**/ ShanxiTV) SR5.950-3/4; TRS8B/ **3854V**/ (HenanTV) SR 4.420-3/4; TRS8C/**3861V**/ (NingxiaTV) SR4.800-3/4. **3861V**/ (SXTVS-NLTVS), SR9.075; **3892V**/(JXTVx4),SR 4.420; **3900V**/ (JSBC), SR6/670; **3910V**/ (feeds) SR6.400); **3929V**/(AHTV), SR8.835; **3940V**/(Tianjin), SR5.950; **3951V**/(BeijingTV), SR9.525; **3980V**/(CCTVx8), SR27.500; **4020V**/(unknown 9 chs), SR27.500; **4060V**/unknown 10 chs), Sr 27.500; **4100V**/(CCTV HD), SR27.500; **4140V**/ (unknown 10 chs), SR27.500;**4175V**/(21 radio),SR5.990;**4192V**/(Hebei), SR6.000.

...

Note: Additional reserved transponders (such as 4040H) to be announced.

brings suit against California based Viewtech (receiver brand Viewsat) charging them with doing just this - importing FTA receivers and then providing user programmable software that circumvents the Nagra encryption. Is this a coincidence?" (**Billy K**, Los Angeles) (Coop's response: Perhaps. Yes, Charlie Ergen, founder and big boss at EchoStar, does receive and read SatFACTS. Also of coincidence, Jung Kwak, the head guy at Viewtech talked with Coop during the April 2006 (not 2007) Atlanta SBE show but not about piracy - conversation limited to their prototype version of a box to allow connecting via Internet your 'at-home-TV' [see SF#151, review of said product by our Tim Alderman; p. 7]. Final coincidence, during April 2007 (this year) SBE in Atlanta, a chap claiming to be the mastermind behind creation of the 'special software' that allows modification of Viewsat receivers to intercept DISH programming introduced himself to Coop and talked at length about how much he was paid to 'adapt' the code.) "On July 13th Senator Coonan threw a ceremonial switch to launch 'NITV' on C1 (12.527V, 30.000, 3/4 Aurora) in place of Imparja's ICTV. This is a national 'Indigenous' TV service whereas ICTV was mostly NT oriented from Alice Springs. $48 million have been allocated to the service which for now is only available via C1, although terrestrial relays are in the planning stage. The quality of the programming shows significantly more professionalism including their own 'Marngrook Footy Show'. (**IF**, Qld.)

An Amazing value:
$402.50 (US) - in 26 publications

$30.00 via airmail !

Satellite Topics

- Home Satellite Reception
- Satellite to Room
- Extra Terrestrial Relays (original Arthur C. Clarke)
- Home Satellite Booklet (original Bob Cooper)
- Howard Terminal Construction Manual
- Swan Spherical Satellite Antenna
- Gustafson Spherical Satellite Antenna
- Gibson Satellite Navigator
- Nelson 13' Satellite Antenna Construction Manual
- Satellite Business Opportunities Manual
- International Satellite Reception Manual (original Steve Birkill)

More than 700 ORIGINAL pages

An irreplaceable collection covering satellite and terrestrial reference material available only on this incredible CD;

Bob Cooper's TV Reception Addendum.

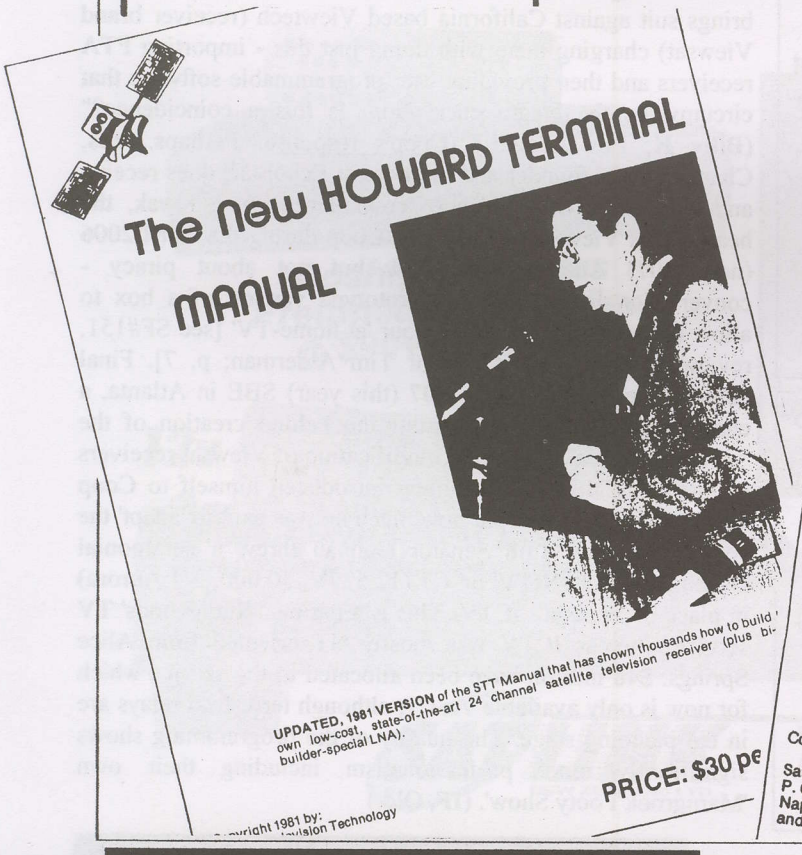
$30 via airmail (page 32)

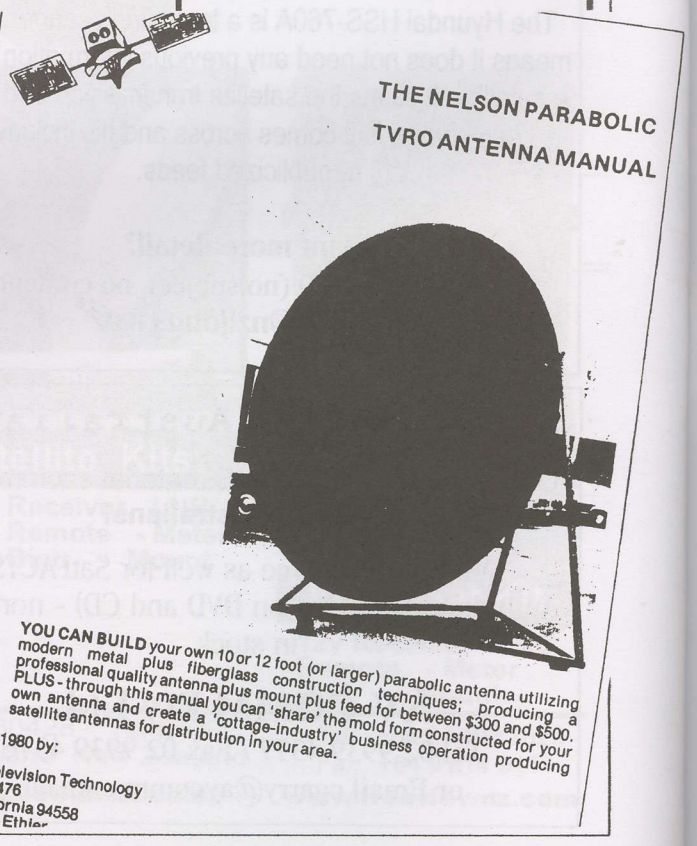
Terrestrial Topics

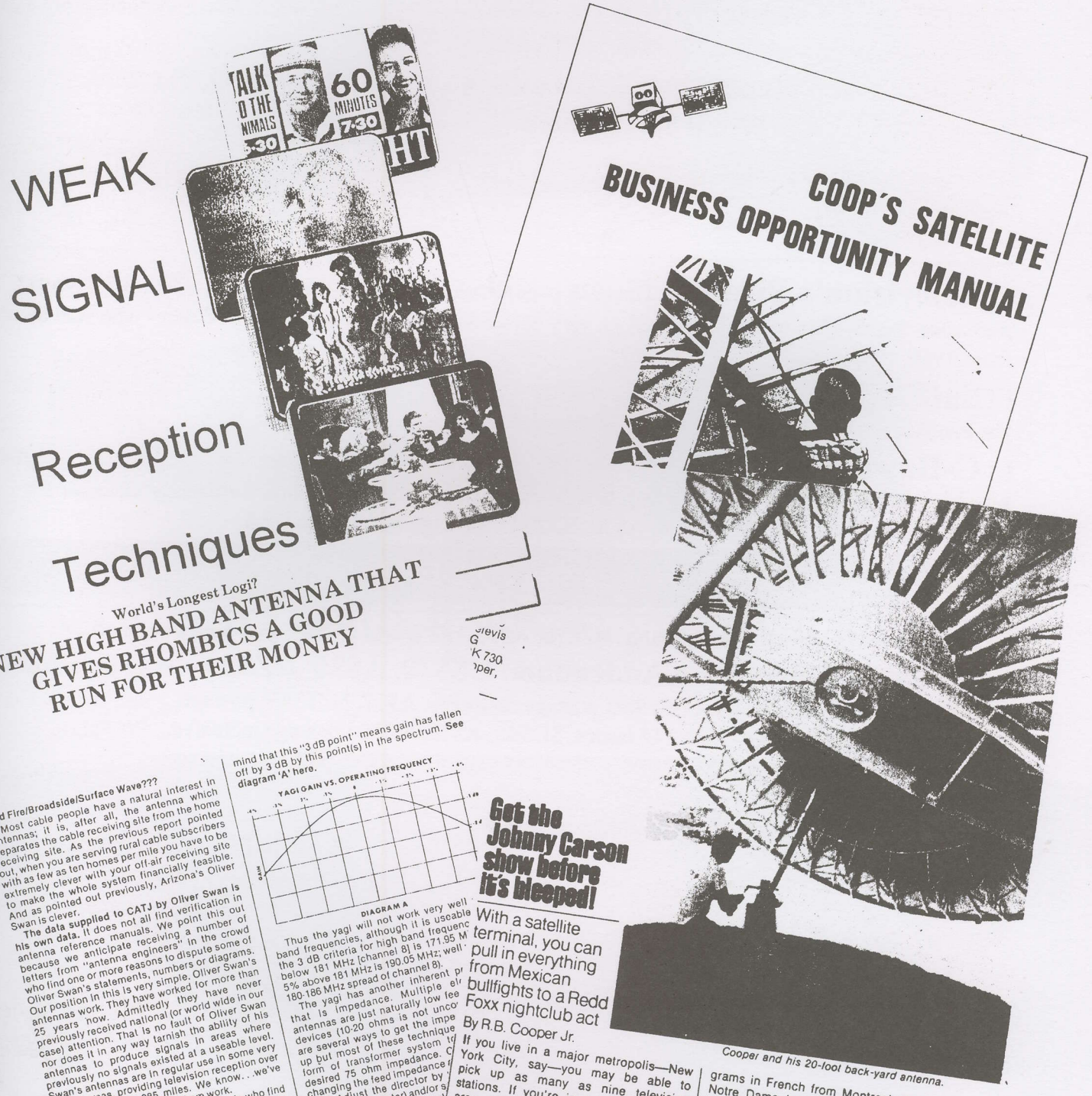
- Eliminating Co-Channel Interference
- Curing Weak Signals
- The UHF Frontier
- Combining Polarities
- Cable TV - Part One
- Cable TV - Part Two
- MATV Wired Systems
- VHF-UHF Receiving Antennas
- World's largest Yagi Design
- Super High Gain TV Antenna

And Extras:

- First Home Dish Announcement
- Coop's Comment
- Addendum Guide and Prologue







World's Longest Logi?

A NEW HIGH BAND ANTENNA THAT GIVES RHOMBICS A GOOD RUN FOR THEIR MONEY

End Fire/Broadside/Surface Wave???

Most cable people have a natural interest in antennas; it is, after all, the antenna which separates the cable receiving site from the home receiving site. As the previous report pointed out, when you are serving rural cable subscribers with as few as ten homes per mile you have to be extremely clever with your off-air receiving site to make the whole system financially feasible. And as pointed out previously, Arizona's Oliver Swan is clever.

The data supplied to CATJ by Oliver Swan is his own data. It does not all find verification in antenna reference manuals. We point this out because we anticipate receiving a number of letters from "antenna engineers" in the crowd who find one or more reasons to dispute some of Oliver Swan's statements, numbers or diagrams. Our position in this is very simple. Oliver Swan's antennas work. They have worked for more than 25 years now. Admittedly they have never previously received national (or world wide in our case) attention. That is no fault of Oliver Swan nor does it in any way tarnish the ability of his antennas to produce signals in areas where previously no signals existed at a useable level. Swan's antennas are in regular use in some very remote areas, providing television reception over paths as long as 385 miles. We know. . .we've been there and we've seen them work.

So we anticipate hearing from people who find some of Oliver's statements difficult to equate to their own experiences. We'll gladly print any such comments in future issues of CATJ.

The end-fire (yagi) antenna has been used in television reception for as long as there has been television, and it has good directivity and bandwidth for single channels in the high band (7-13) region. When a yagi is used for broad banded reception, the maximum (gain) directivity is limited to approximately 3 dB at 5% of the center frequency. In other words, a yagi antenna cut for 61 MHz (channel 3 visual) will have gain plus or minus 3 dB of the maximum gain at a frequency 5% below 61 MHz (57.95 MHz) and at a frequency 5% above 61 MHz (64.05 MHz). Keep in mind that this "3 dB point" means gain has fallen off by 3 dB by this point(s) in the spectrum. See diagram 'A' here.

DIAGRAM A

Thus the yagi will not work very well
band frequencies, although it is useable
the 3 dB criteria for high band frequenc
below 181 MHz (channel 8) is 171.95 M
5% above 181 MHz is 190.05 MHz; well
180-186 MHz spread of channel 8).

The yagi has another inherent p
that is impedance. Multiple el
antennas are just naturally low fee
devices (10-20 ohms is not unco
are several ways to get the impe
up but most of these technique
form of transformer system to
desired 75 ohm impedance. C
changing the feed impedance
(1) Adjust the director by
size (diameter) and/or s
(2) Used a folded or mul
antenna;
(3) Adjust the reflector
size (diameter) and/
Virtually any modifica
bring about a decrease
other words, to attain
some of the desirable
sacrificed.

What is it about
frequency-selectiv
turns out, are rela

Get the Johnny Carson show before it's bleeped!

With a satellite terminal, you can pull in everything from Mexican bullfights to a Redd Foxx nightclub act

By R.B. Cooper Jr.

If you live in a major metropolis—New York City, say—you may be able to pick up as many as nine television stations. If you're in a rural or remote area, perhaps you get only one or two stations—or none at all.

I live on a farm, 20 miles outside of Oklahoma City. And in my house we have a choice of 36 different TV channels. We watch live soccer from Argentina, bullfights from Mexico, programs in French from Montreal. We get Notre Dame basketball and live sports from Madison Square Garden. We receive programming that's normally available only to those who have cable or pay-TV services (Home Box Office, Showtime, Fanfare and others) that offer special sporting events, seven to 12 hours per day of first-run movies (without commercials) and the nightclub acts of such performers as Redd Foxx, Helen Reddy, Tom Jones and dozens of others. Then there is Atlanta's WTCG, the 24-hour sports-and-movie station →

R.B. Cooper Jr., is editor in chief of CATJ, a cable-television trade magazine published in Oklahoma City.

Cooper and his 20-foot back-yard antenna.

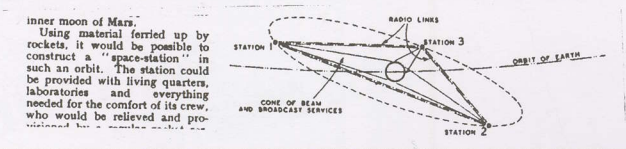
This month's Special Offer:

Massive Television Reception Library on CD - $30!

SatFACTS is THE world-girdling source - **NOBODY** has as much technical and reference material available - **NOBODY!** And virtually ALL of it is original to Coop.

☐ **SatFACTS subscription** - 12 more issues of this publication, now completing 13 years of continuous publication. NZ$70, A$96, US/World $75.

☐ **Coop's TV Reception Addendum** (see p. 30-31), CD; NZ $30, Australia $30, US/World $30 airmail.



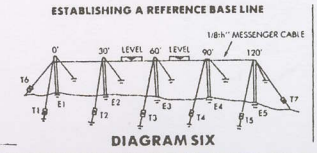
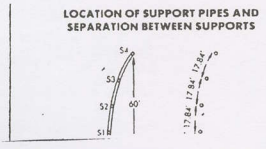


DIAGRAM SIX



☐ **Television's Pirates** - The (928 page) book. This is the story of who, what, why, where and when the satellite industry evolved - a very personal memoir from the pen of Coop - who was there from 1950. Released April 2006; US$29, A$37, NZ$41 + postage outside USA.

☐ **SatFACTS Anthology** - Issues #1 to #144 on DVD and CD. If something happened in the Pacific or Asia during these 12 years, you will find it here. US$40, A$50, NZ$50 + postage.

☐ **C-Band Remembered** - the (227 page) book written by dozens of industry pioneers; their own stories, in their own words, revealing how America's export of C-Band technology changed the world. Released April 2007. US$20, A$30, NZ$34 + postage outside the USA.

This is the ORDER form.

☐ **SatFACTS 12 month subscription**: NZ$70, A$96, US/World US$75; fast-airmail posted.

☐ **Coop's TV Reception Addendum**: US$30, A$30, NZ$30 postage inclusive.

☐ **Television's Pirates Book**: US$29.95 postage inclusive; A$37, NZ$34 + postage.

☐ **SatFACTS Anthology** - first 144 issues: $US40, A$40, NZ$50 postage inclusive.

☐ **C-Band Remembered**: US$20 postage inclusive, A$30, NZ$34, NZ$34 + postage.

Ship to:

Name _____ Company _____

Mailing address _____

Town/city _____ Postal Code _____ State/ Province _____ Country _____

Charge to:

☐ Visa ☐ Mastercard __ __ __ __ - __ __ __ __ - __ __ __ __ - __ __ __ __

Card expires _____/_____ Name as appears on card _____

☐ Cheque/check enclosed (to SatFACTS) in amount of (calculate from above) $_____.____

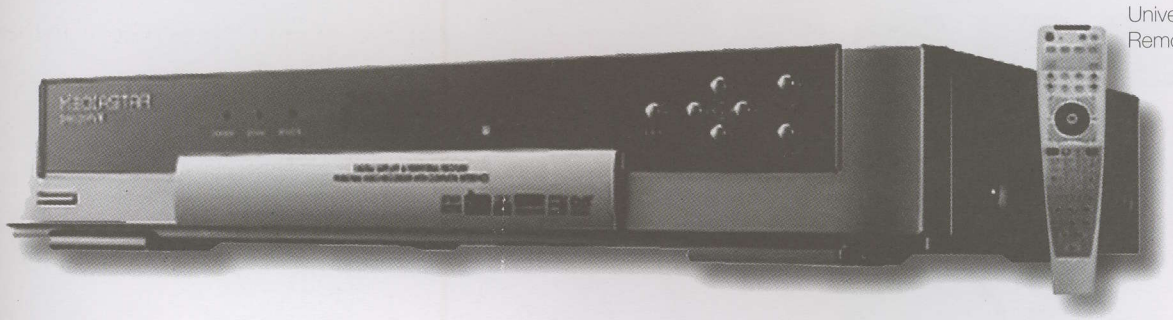
Placing order:

Fax this page to ++64 9 406 1083, Email skyking@clear.net.nz or by mail to:
SatFACTS, PO Box 330, Mangonui, Far North 0442, New Zealand

MEDIASTAR
DW820PVR

120GB Hard Disc Drive

FREE
SelecTV card
when you buy a
DW820PVR
(Conditions apply)



Universal Multi Device
Remote Control

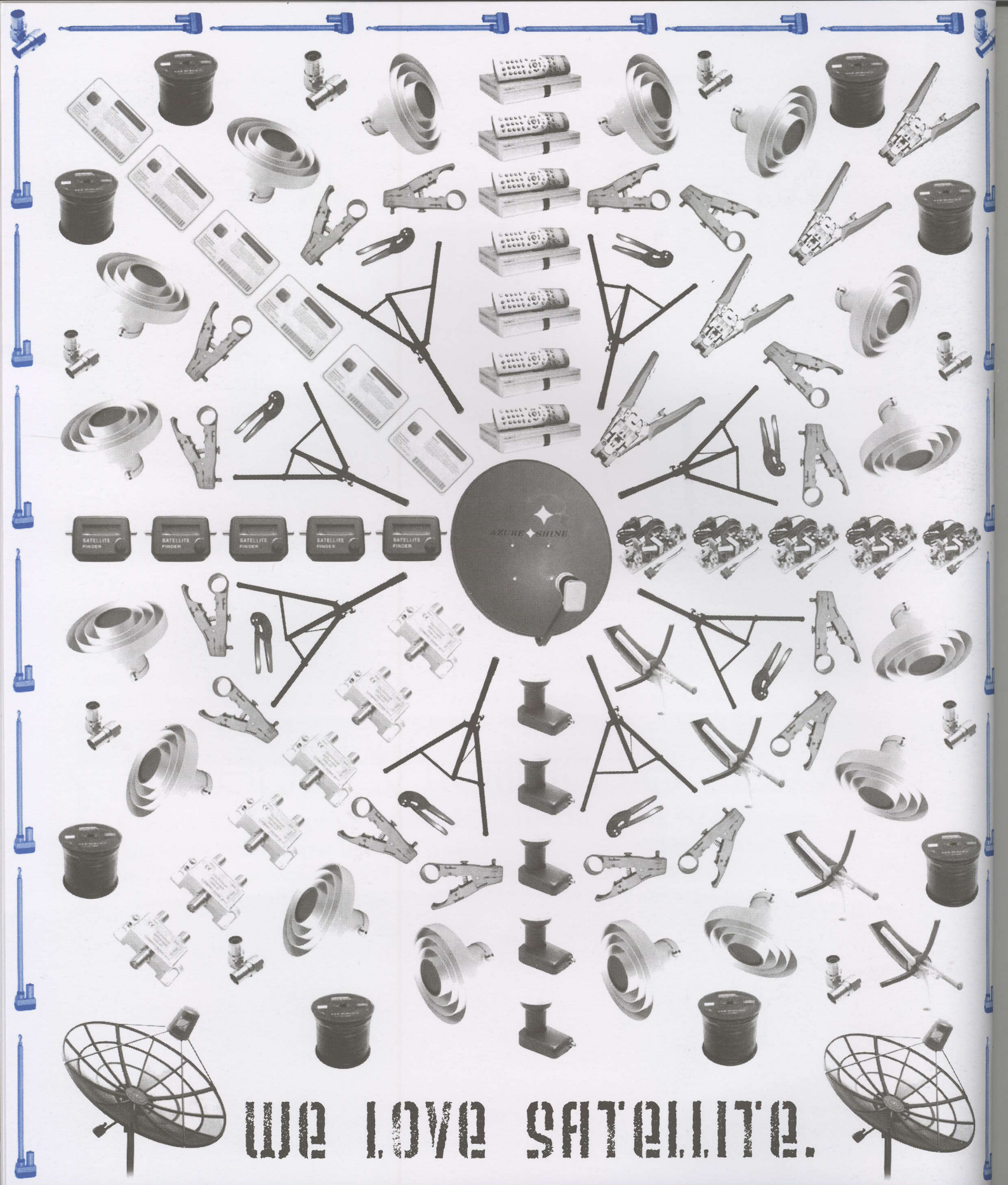
Power. Simplicity. Quality.

Features:

- Satellite (QPSK) and Terrestrial (COFDM) tuners
- 2 slots common interface compatible with Irdeto, Viaccess, MediaGuard and Conax Cams
- Direct YCbCr component, S-Video, Composite and Dual Audio outputs
- MP3, PCM playback
- MP Layer I & II, CD Quality Audio Sound
- RS-232 Port for S/W upgrade (115,200bps)
- Connect to PC via USB 2.0
- Watch two live streams or 1 playback & 1 channel live stream
- Multichannel recording with 1 channel playback
- Parental Control
- Powerful, easy edit function
- Games: Tetris, Block Out & Sokoban
- Picture in Graphics
- On Screen Channel Information
- Auto & Manual Search functions
- User Friendly
- Parental lock function
- Teletext & subtitle supported
- Channel editor & channel loader in PC environment
- Software transfer from receiver to receiver
- 40-event timer control
- Coaxial & Optical outputs for digital audio
- Universal multi device remote control

- Available from Harvey Norman.

For more information visit **mediastar.com.au** or call **02 9618 5777**



SCITEQ
Pty Ltd A.B.N 34 009 235 090

Ph: +61 8 9409 6677
Fax: +61 8 9309 5210
sales@sciteq.com.au
www.sciteq.com.au